

TM 11-5815-205-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL
FIELD, AND DEPOT MAINTENANCE
TELETYPEWRITER CENTRAL
OFFICE AN/MGC-17



HEADQUARTERS, DEPARTMENT OF THE ARMY
NOVEMBER 1959

WARNING

HIGH VOLTAGE
is used in
this equipment.

DEATH ON CONTACT
may result if safety precautions
are not observed.

DANGEROUS POTENTIALS
exist in the following units:

Ac Power Duct

Communication Security Equipment TSEC/KW-9 (KAM-10/TSEC)

POWER DISTRIBUTION PANEL

SIGNAL & POWER ENTRANCE Box

Signal Duct

Teletypewriter Reperforator-Transmitter TT-76(*)/GGC (TM 11-2225)

Teletypewriter TT-4(*)/TG (TM 11-5815-206-12)

Telegraph Terminal TH-5/TG (TM 11-2239)

Telegraph-Telephone Signal Converter TA-182/U (TM 11-2137)

Trailer Mounted Gasoline Engine Generator Set PU-322/G (TM 11-900A)

All operating adjustments of this equipment are made with the power applied. Be careful when working on the wiring side of the equipment.

DON'T TAKE CHANCES

VENTILATION

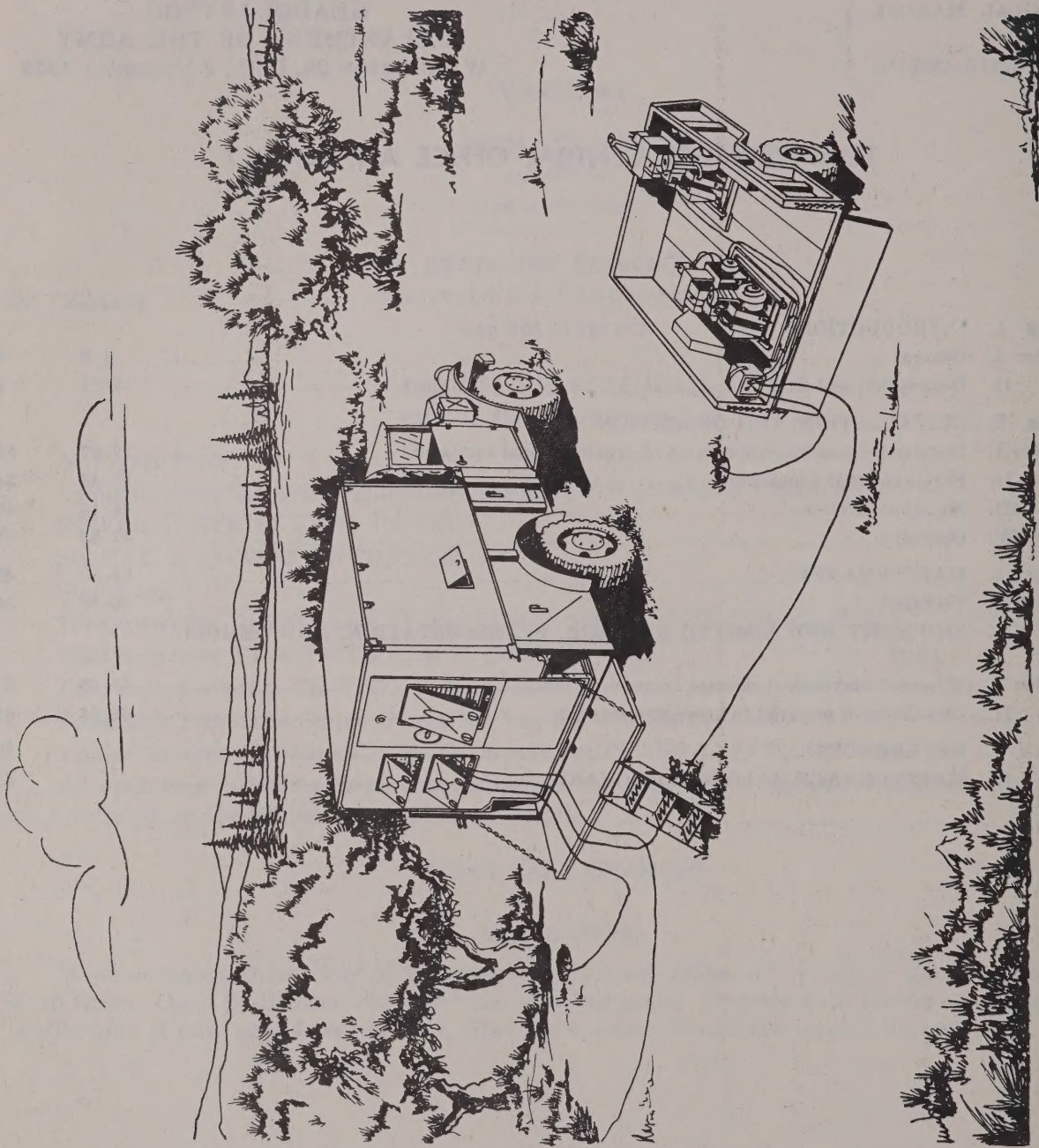
When occupied, the shelter of Teletypewriter Central Office AN/MGC-17 must be ventilated at all times. Open the blower vents and the air filter cover. Operate both blowers for maximum ventilation. If only one blower is used, close the outside vent of the unused blower.

TECHNICAL MANUAL }
 No. 11-5815-205-15 }

HEADQUARTERS,
 DEPARTMENT OF THE ARMY
 WASHINGTON 25, D. C., 2 November 1959

TELETYPEWRITER CENTRAL OFFICE AN/MGC-17

	Paragraph	Page
CHAPTER 1. INTRODUCTION		
Section I. General	1, 2	3
II. Description and data	3-21	4
CHAPTER 2. INSTALLATION AND OPERATION		
Section I. Installation and interconnection of organizational equipment	22-37	22
II. Preoperational procedures	38-43	34
III. Signal connections	44-46	40
IV. Operation	47-53	41
CHAPTER 3. MAINTENANCE	54-59	49
4. THEORY	60-63	56
5. SHIPMENT AND LIMITED STORAGE, TRANSPORTATION, AND DEMOLITION		
Section I. Shipment and limited storage, transportation	64, 65	60
II. Demolition of materiel to prevent enemy use	66, 67	61
APPEND X I. REFERENCES		62
II. MAINTENANCE ALLOCATION CHART		63
INDEX		70



TM5815-205-15-1

Figure 1. Teletypewriter Central Office AN/MGC-17, connected for operation.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual contains a description and theory of Teletypewriter Central Office AN/MGC-17 (fig. 1) and instructions for its installation, operation, and maintenance. It includes instructions for operation under usual and unusual conditions and for cleaning and inspecting the equipment. Information on system and common items for Teletypewriter Central Office AN/MGC-17 is contained in TM 11-5805-204-15.

b. The organizational equipments are covered in detail in their respective technical manuals. The term "organizational equipment" is used throughout this manual to indicate components of the AN/MGC-17 which are normally supplied by the using organization. These items are listed in paragraph 5b. A complete list of references is contained in appendix I.

c. Detailed information about the Communication Security Equipment is not included in these instructions. Sufficient information is provided, however, to permit installation and testing of the Communication Security Equipment.

d. Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. Thus, Teletypewriter TH-4(*)/TG represents Teletypewriter TT-4A/TG and Teletypewriter TT-4B/TG; Teletypewriter Reperforator-Transmitter TT-76(*)/GGC represents Teletypewriter Reperforator-Transmitter TT-76/GGC, Teletypewriter Reperforator-Transmitter TT-76A/GGC, and Teletypewriter Reperforator-Transmitter TT-76B/GGC.

2. Forms and Records

a. *Unsatisfactory Equipment Report.* Fill out and forward DA Form 468 (Unsatisfactory

Equipment Report) to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-38. Fill out and forward DD Form 787-1 (Electronic Failure Report — Signal Equipment) on Communication Security Equipment to Commanding Officer, U. S. Army Signal Communications Security Agency, Arlington Hall Station, Arlington 12, Va., ATTN: SIGCR-4.

b. *Report of Damaged or Improper Shipment.* Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army). Forward DD Form 6 on Communication Security Equipment to Commanding Officer, U. S. Army Signal Communications Security Agency, Arlington Hall Station, Arlington Hall 12, Va., ATTN: SIGCR-4.

c. *Preventive Maintenance Forms.* Prepare preventive maintenance forms for the main components of Teletypewriter Central Office AN/MGC-17 as specified in appropriate technical manuals (app. I). Prepare preventive maintenance forms for Communication Security Equipment as specified in forms provided by the Commanding Officer, USASCSA.

d. *Comments on Maintenance Allocation Chart.* Any comments concerning omissions and discrepancies in the maintenance allocation chart (app. II) will be prepared on DA Form 2028 and forwarded direct to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., ATTN: SIGFM/ES-M.

e. *Comments on Manual.* Forward all comments on this publication direct to Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Teletypewriter Central Office AN/MGC-17 is an air- or vehicular-transportable voice-frequency (VF) telegraph switching center. It is used as a telegraph central office in a division area of an area type communications system. It contains facilities for three teletypewriter circuits which may be operated full-duplex or half-duplex. Communication Security Equipment (on-line or off-line) is provided for use on one full-duplex or two half-duplex teletypewriter circuits. The AN/MGC-17 also provides 12 lines for switching telegraph transmission from other components in an area type communications system or from local subscribers. Two of the switchboard lines are equipped with VF ringers. Four additional VF ringers are provided for use as required. Trailer Mounted Gasoline Engine Generator Set PU-322/G, (two Power Units PE-75/AF) supplies the alternating-current (ac) power required to operate the AN/MGC-17.

4. Technical Characteristics

Technical characteristics of the organizational equipment are given in their respective technical manuals (app. I). Overall technical characteristics for Teletypewriter Central Office AN/MGC-17 are given below.

Teletypewriter circuits - 3 (half or full duplex).

Teletypewriter switchboard circuits. 12 (manual switching).

Intershelter communication facilities. 1.

Security circuits:

Full duplex ----- 1.
or

Half duplex ----- 2.

Power requirements:

Input to shelter ----- 115 volts \pm 10%,
60 cps single
phase.

Power consumption:

Shelter lighting ---- 135 watts.

Telegraph Terminals TH-5/TG. 180 watts.

Telegraph - Telephone Signal Converters. 240 watts.

Teletypewriter Re-perforator-Transmitters TT-76(*)/GGC. 300 watts.

Teletypewriter TT-4(*)/TG. 150 watts.

Security equipments 360 watts.

Blowers ----- 248 watts.

Heater ----- 1,500 watts.

Total ----- 3,113 watts.

Output from PE-75/AF 2,500 watts.
(part of PU-322/G).

Note. DO NOT OPERATE the heater when all organizational equipments are operating. The total power requirements, with all equipment operating, exceeds the maximum output of the power unit.

Weight:

Shelter (complete with organizational equipment). 1,400 lb.

Trailer Mounted Gasoline Generator Set PU-322/G. 2,300 lb.

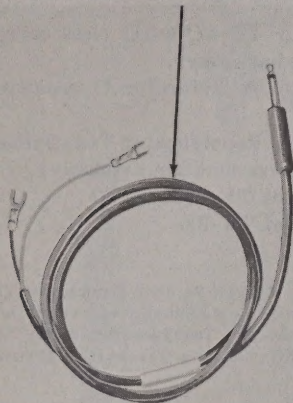
5. Components of Teletypewriter Central Office AN/MGC-17

The charts in *a* through *d* below list the main components (less organizational equipment), organizational equipment, components stored in ACCESSORIES & SPARES cabinet, and running spares. A complete list of components is contained in publications covering the repair parts and special tools list for Teletypewriter Central Office AN/MGC-17.

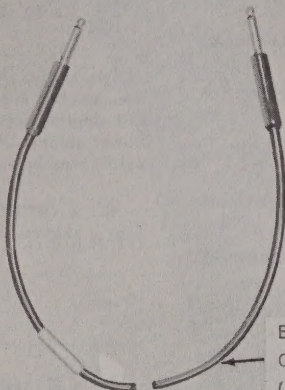
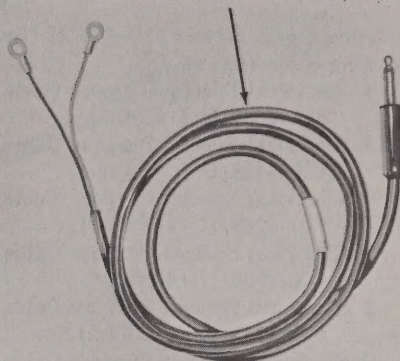
a. Main Components (Less Organizational Equipment).

Quantity	Item
1	Modified Electrical Equipment Shelter S-144/G (fig. 1), complete with mountings and minor components (60½ in. high, 75½ in. long, 57¾ in. wide, 160 cubic ft volume).
1	Trailer Mounted Gasoline Engine Generator Set PU-322/G (fig. 1) (83 in. high, 147 in. long, 73½ in. wide, 520 cubic ft volume).
2	Distribution Box J-1077/U (fig. 7).
1	Electrical Cord Assembly CX-4695/U (6 ft) (fig. 2).
2	Electrical Power Cable Assembly CX-4693/U (25 ft) (fig. 10).
1	Electrical Power Cable Assembly CX-4694/U (100 ft) (fig. 10).

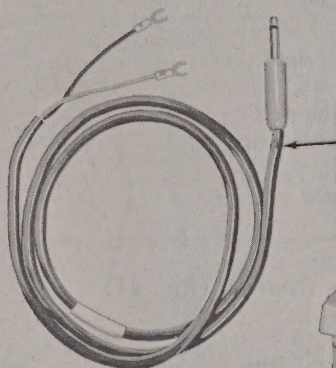
ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4766/U (4FT 8-1/4IN.)



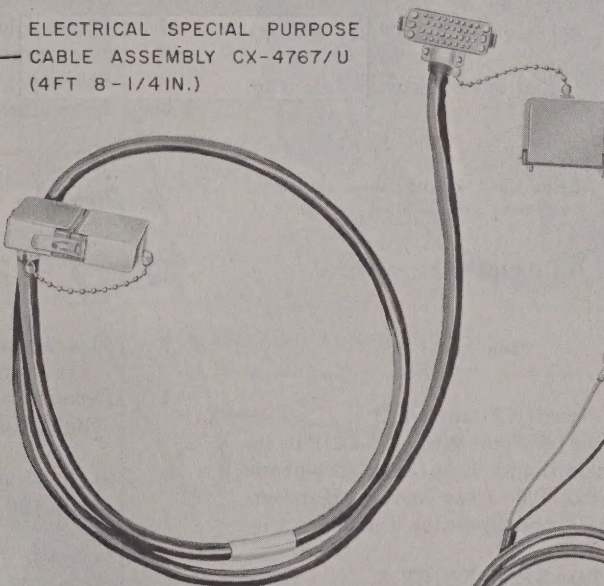
ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4764/U (7FT 8IN.)



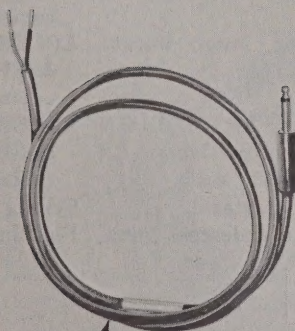
ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4768/U
(10 IN., 1FT 4IN., 2FT 4IN., 4FT, 5FT 6IN.)



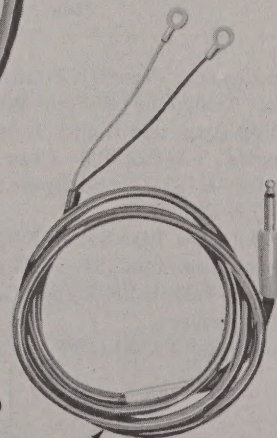
ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4767/U
(4FT 8-1/4IN.)



ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4876/U (5FT 5IN.)



ELECTRICAL CORD ASSEMBLY
CX-4695/U (6 FT)



ELECTRICAL SPECIAL PURPOSE
CABLE ASSEMBLY CX-4765/U (7FT 8IN.)

TM5815-205-15-2

Figure 2. Patching and installation cords and cables.

Quantity	Item
1	Electrical Space Heater HD-375/U (fig. 8).
37	Patching cords (fig. 2):
4	Electrical Special Purpose Cable Assembly CX-4768/U (10 in.).
16	Electrical Special Purpose Cable Assembly CX-4768/U (1 ft 4 in.).
8	Electrical Special Purpose Cable Assembly CX-4768/U (2 ft 4 in.).
2	Electrical Special Purpose Cable Assembly CX-4768/U (4 ft).
1	Electrical Special Purpose Cable Assembly CX-4768/U (5 ft 6 in.). ^a
2	Electrical Special Purpose Cable Assembly CX-4876/U (5 ft 5 in.). ^a
1	Electrical Special Purpose Cable Assembly CX-4766/U (4 ft 8¼ in.). ^a
1	Electrical Special Purpose Cable Assembly CX-4767/U (4 ft 8¼ in.). ^a
1	Electrical Special Purpose Cable Assembly CX-4764/U (7 ft 8 in.). ^a
1	Electrical Special Purpose Cable Assembly CX-4765/U (7 ft 8 in.). ^a
1	Switch Box SA-331/U (fig. 6).
2	Telephone Cable Assembly CX-4566/G (250 ft) (fig. 10).
1	Three combination, dial type, security safe (fig. 6).

^a Used for permanent connections when organizational equipment and Communication Security Equipment are installed.

b. Organizational Equipment.

Quantity	Item
2	Communication Security Equipment.*
1	Manual Telephone Switchboard SB-22/PT including two additional Line Jack Telephone Circuits TA-222/PT (less cover, Handset-Headset H-81/U, and Operator Telephone Circuit TA-221/PT).
1	Range Adapter Test Set TSEC/ST-3.
3	Telegraph Terminal TH-5/TG (less cover).
6	Telegraph-Telephone Signal Converter TA-182/U (less cover).
1	Telephone Set TA-312/PT (less carrying case).

Quantity	Item
1	Teletypewriter TT-4(*)/TG (less carrying case and immersion cover).
1	Teletypewriter Reperforator-Transmitter TT-76 (*)/GGC.
1	Teletypewriter Reperforator-Transmitter TT-76 (*)/GGC (less chad bin assembly).
1	Tool Equipment TE-49.
2	Tool Equipment TE-33.

* Normally, two Communication Security Equipments TSEC/KW-9 are supplied for half-duplex or full-duplex operation; however, for full duplex operation only, one Teletypewriter Mixer SSM-33 and Power Supply PP-1209/FG, and two Transmitter Distributors TT-21/FG may be supplied.

c. Components Stored in ACCESSORIES & SPARES Cabinet (fig. 3).

Quantity	Item
1	Extension light
1	Ground lead
5	Power cable grip
20	26-pair cable grip
2	Shackles
1 box	Thumbtacks

d. Running Spares (fig. 4).

Quantity	Item	Location
2	Fluorescent lamp, 20 watts, 115 volts, 24 inches.	Ceiling
1	Incandescent lamp (extension light), 50 watts, 115 volts.	ACCESSORIES & SPARES cabinet.
1	Shelter neon lamp, 3-watt, 105-120 volts.	ACCESSORIES & SPARES cabinet.
3	POWER DISTRIBUTION PANEL neon lamp, 1.4 watt, 105-120 volts.	ACCESSORIES & SPARES cabinet.
3	Fluorescent starter	Ceiling
1	Flashlight incandescent lamp	Flashlight

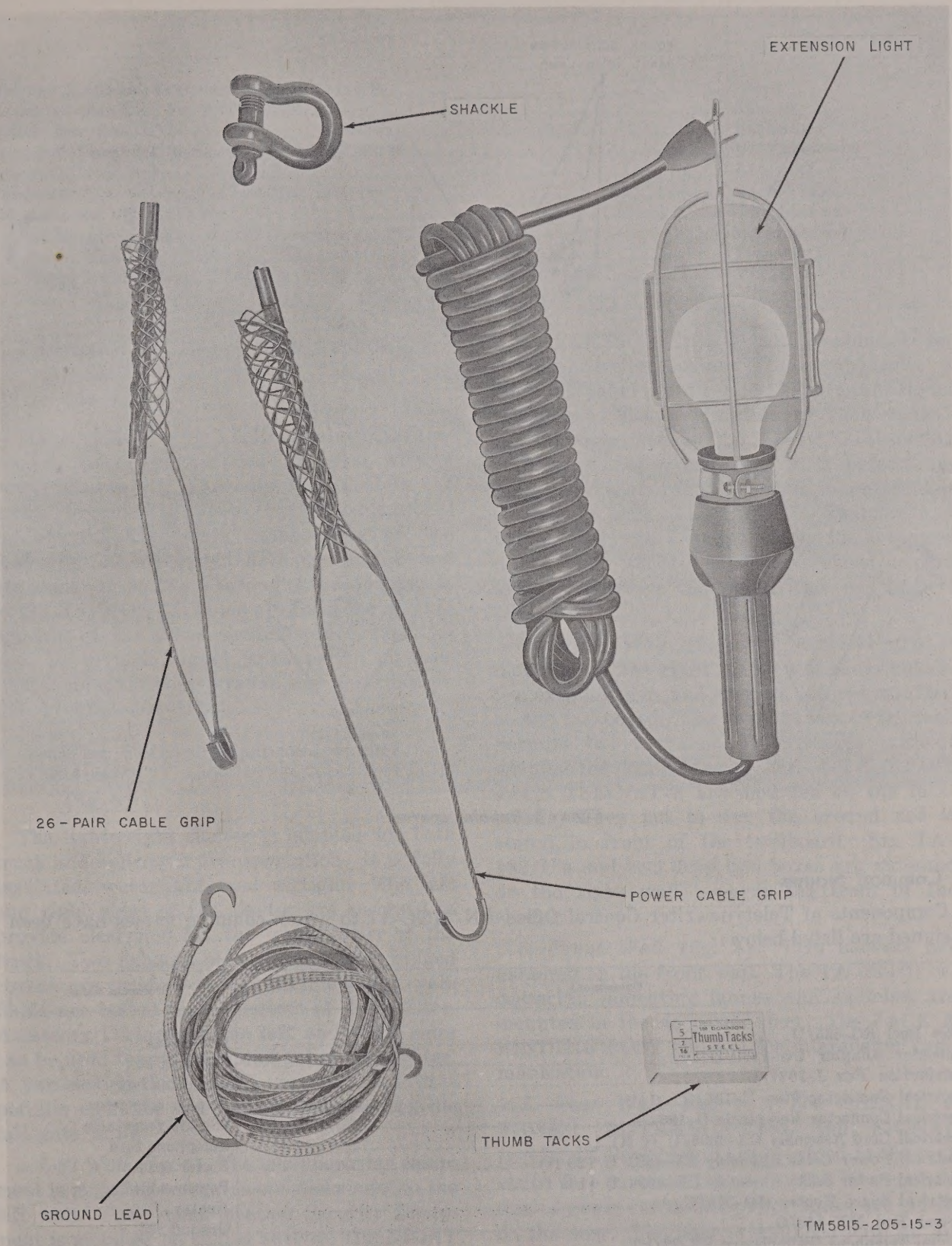
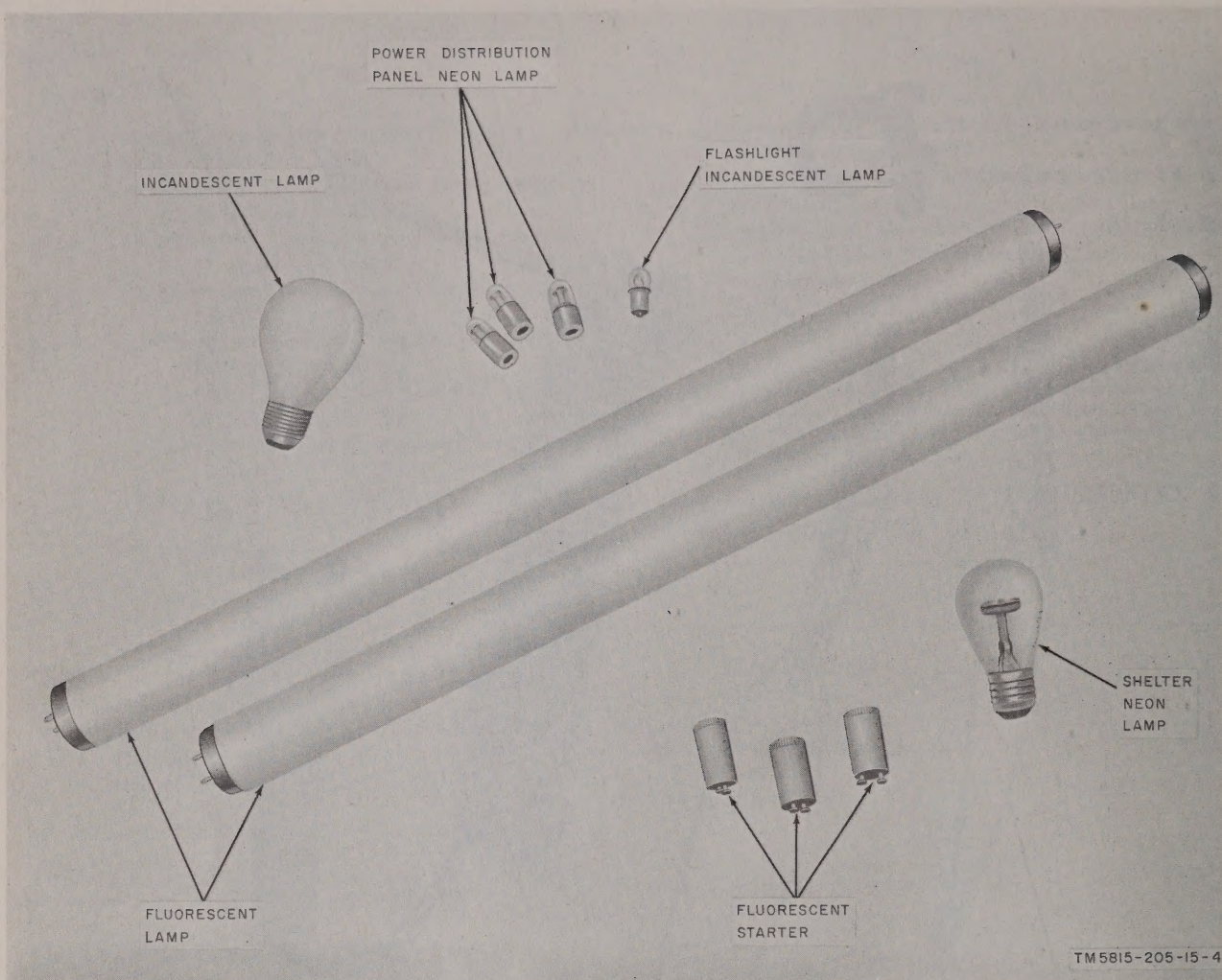


Figure 3. Miscellaneous components stored in ACCESSORIES & SPARES cabinet.



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Figure 4. Running spares.

6. Common Names

Components of Teletypewriter Central Office AN/MGC-17 to which common names have been assigned are listed below:

Component	Common name
Cable Reel RC-435/U	Cable reel
Connector Adapter UG-1312/U	Junction box
Distribution Box J-1077/U	Drop line box
Electrical Connector Plug U-185/G	26-pair connector
Electrical Connector Receptacle U-186/G	26-pair receptacle
Electrical Cord Assembly CX-4695/U (6 ft)	Telephone cord
Electrical Power Cable Assembly CX-4693/U (25 ft)	Power stub
Electrical Power Cable Assembly CX-4694/U (100 ft)	Power cable
Electrical Space Heater HD-375/U	Heater
Ground Rod MX-148/G	Ground rod
Manual Telephone Switchboard SB-22/PT:	Switchboard
Line Jack Telephone Circuit TA-222/PT	Line pack
Accessory Kit MX-230/PT	Accessory kit

Component	Common name
Modified Electrical Equipment Shelter S-144/G	Shelter
Range Adapter Test Set TSEC/ST-3	Test set
Switch Box SA-331/U	Switch box
Telegraph-Telephone Signal Converter TA-182/U	VF ringer
Telegraph-Line Control C-2894/TG	Line unit
Telephone Cable Assembly CX-4566/G (250 ft)	26-pair cable
Telephone Set TA-312/PT	Telephone set
Trailer Mounted Gasoline Engine Generator Set PU-322/G:	Generator set
Power Unit PE-75/AF	Power unit
¾-ton 2-wheel Cargo Trailer M101	Trailer

7. Description of Teletypewriter Central Office AN/MGC-17 (fig. 1)

The AN/MGC-17 is a self-contained, shelter-housed, teletypewriter central office with a power source. It is usually furnished to the using organization less the organizational equipment. The main components of the AN/MGC-17 are listed in paragraph 5 and are shown in figures 6 through 10. Components of the AN/MGC-17 which are the same as components of the other shelter-housed facilities used by division signal personnel in an area type communications system are described in TM 11-5805-204-15.

8. Modified Electrical Equipment Shelter S-144/G (fig. 5)

The lightweight shelter is adapted for both truck and helicopter transportation. It is fully insulated, watertight, and airtight. The left and right sides of the shelter are recessed to provide clearance for the wheel wells of the truck. Two exhaust blower vents with hinged covers are located on the outside front wall. Skids are bolted to the bottom of the shelter. Accessory D-rings on the left and right sides can be used for tying equipment to the shelter. A two-section door at the rear of the shelter permits entrance when truck-mounted and the tail gate is up.

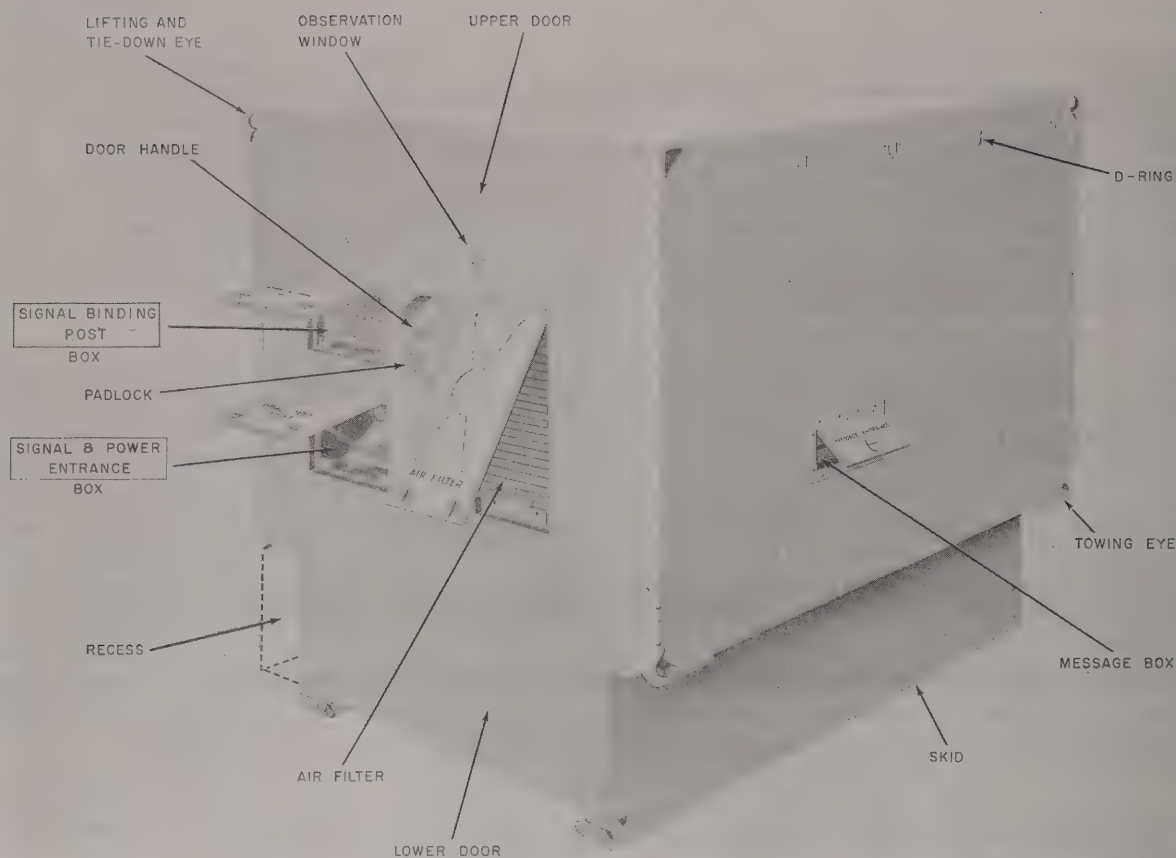
a. Left Wall (fig. 6). The teletypewriter equipment is mounted on equipment racks next to the left wall. The Communication Security Equipment is mounted on sliding shelves. The NIGHT ALARM BATTERY box contains the batteries normally mounted in the rear of the SB-22/PT.

The ACCESSORIES & SPARES cabinet is for storing miscellaneous and loose components. A patching panel is for connecting organizational equipment. Two folding chairs (not shown) are stored in front of the TT-4(*)/TG during transit. A switch box, used to transfer from one power source to another, is mounted next to the left wall. The TG-5/TG switches and indicating lamps are mounted in the ac power duct. When not in use, the cable reel holders are stored above the switch box on the left wall.

b. Right Wall (fig. 7). A tackboard is mounted on the right wall. A manual holder, fire extinguisher, and first aid kit are mounted on the tackboard. The message box in the wall permits the exchange of messages without opening the door of the shelter. A TA-312/PT and a TSEC/ST-3 are mounted on the tackboard. When not in use, the ground rod is stored in front of the tackboard. Six TA-182/U's and two drop line boxes are mounted on the right wall towards the front of the shelter.

c. Front Wall (fig. 8). Two blowers are mounted on the front wall. The TA-182/U receptacles, indicating lamps, and switches are mounted in the ac power duct. The JACK & BINDING POST panel is for intershelter communication.

d. Rear Wall (fig. 9). The SIGNAL & POWER ENTRANCE box and SIGNAL BINDING POSTS box are mounted in the rear wall. Two junction boxes, for the interconnection of power cables and power stubs, are stored on the door. The door is equipped with an air vent with an air filter. An observation window in the door enables the occupants of the shelter



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Figure 5. Modified Electrical Equipment Shelter S-144/G.

to identify callers without opening the door. The switches that control the shelter lighting are in the ac power duct on the rear wall.

e. Floor (fig. 10). Storage mountings are provided on the floor for the switchbox, heater, and Tool Equipment TE-49. Recessed cable reel mountings are used to retain cable reels when the shelter is in transit. The ladder is attached to the reels by webbing straps.

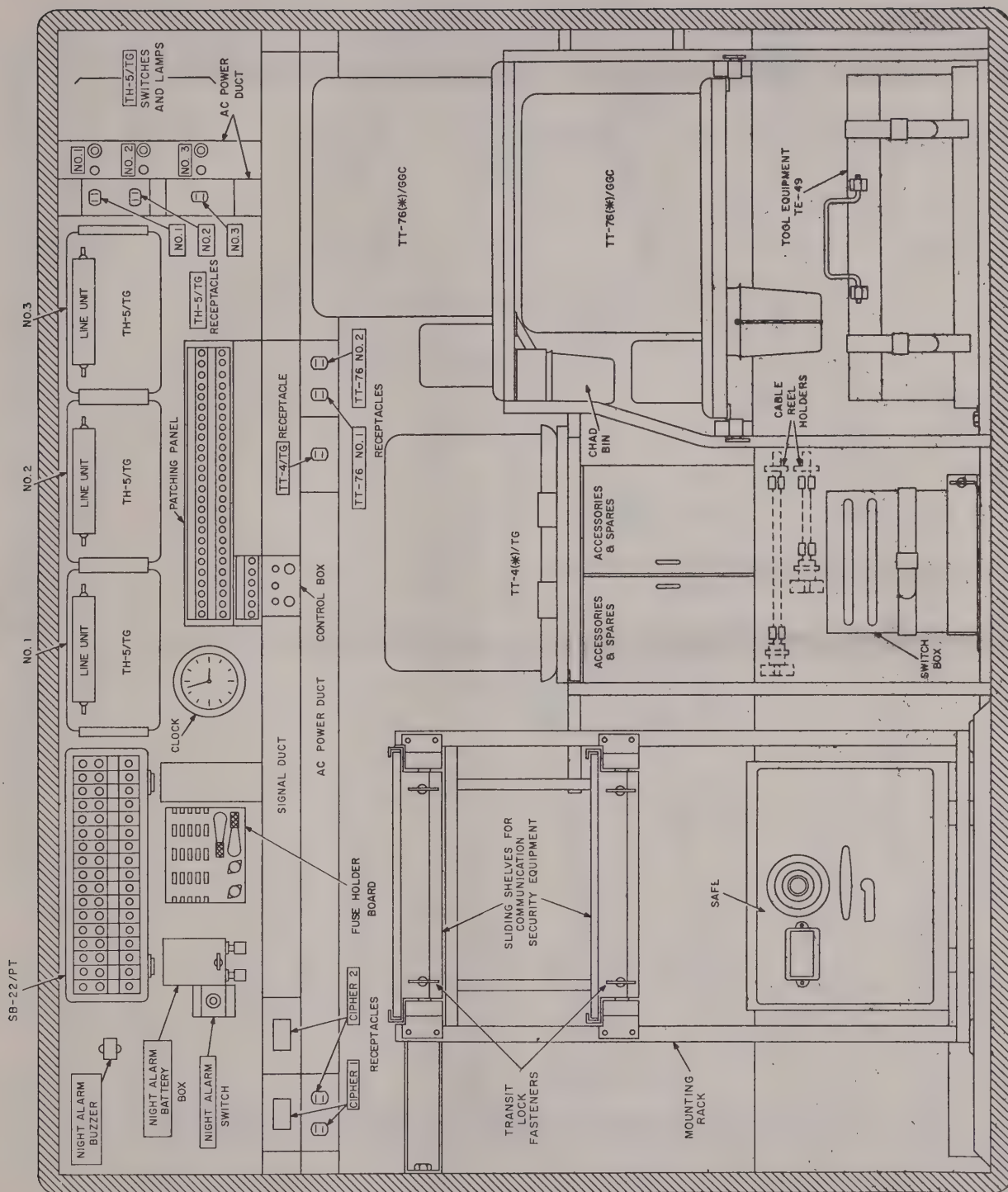
f. Lighting. Four 20-watt fluorescent lamps provide the general lighting for the shelter. A neon lamp (fig. 9) is next to the door. The NEON, NORMAL-BLACKOUT, and FLUORESCENT switches are mounted near the door. With the NORMAL-BLACKOUT switch in the BLACKOUT position, the shelter lights (through the operation of the microswitch) will go out when the door is opened.

g. Power and Wiring. The external ac power

source is connected to the shelter at the SIGNAL & POWER ENTRANCE box (fig. 12) and is distributed to the individual circuits through the POWER DISTRIBUTION PANEL (fig. 13). The teletypewriter and telephone circuits are connected to the shelter at the SIGNAL & POWER ENTRANCE box or the SIGNAL BINDING POSTS box (fig. 11) and are routed through the signal duct (fig. 6) to the patching panel (fig. 14) and to the switchboard. All the interior shelter wiring and cabling is contained in metal ducts which are equipped with removable covers. The ac power outlets in the shelter are all twist-lock receptacles.

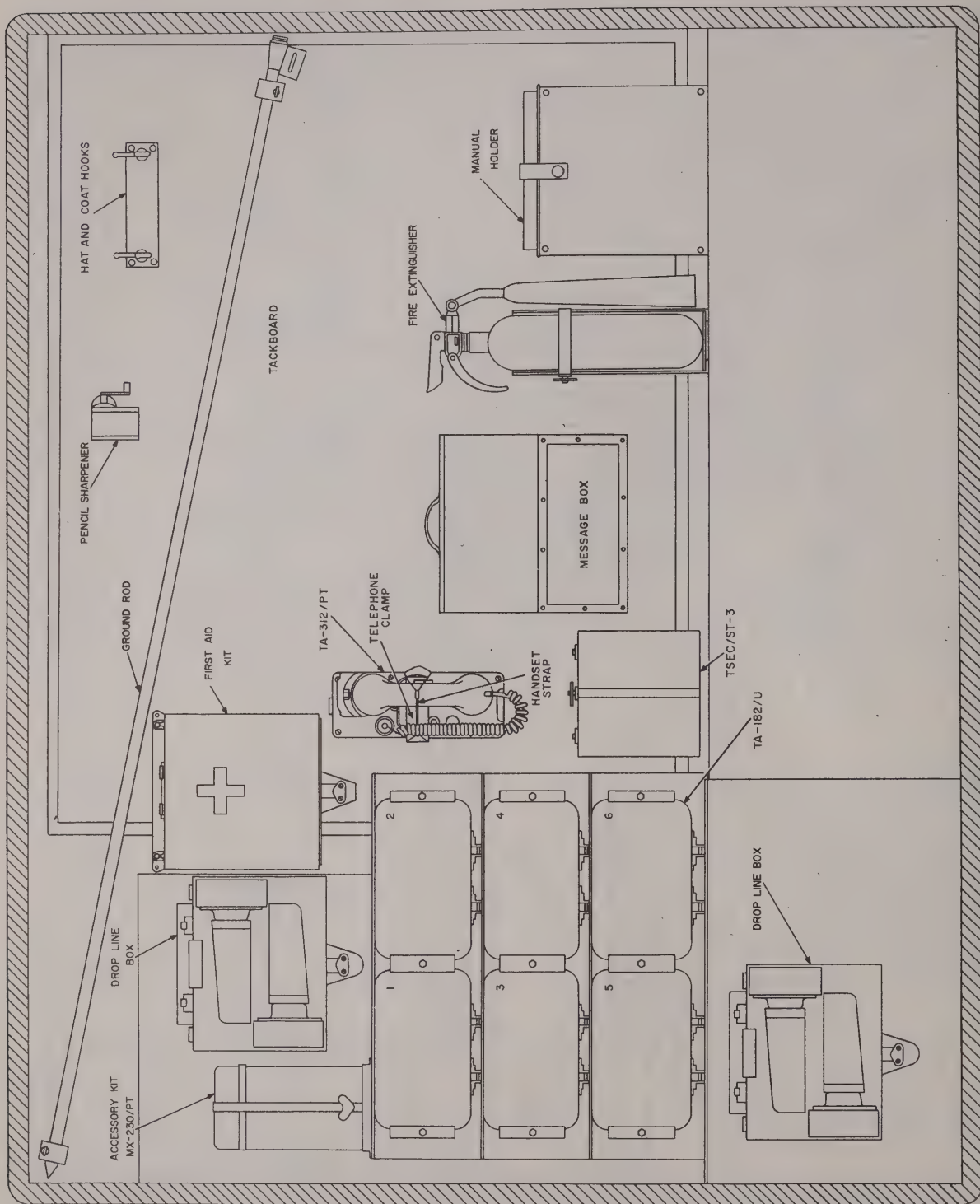
9. Trailer Mounted Gasoline Engine Generator Set PU-322/G (fig. 1)

The generator set supplies the ac power nec-



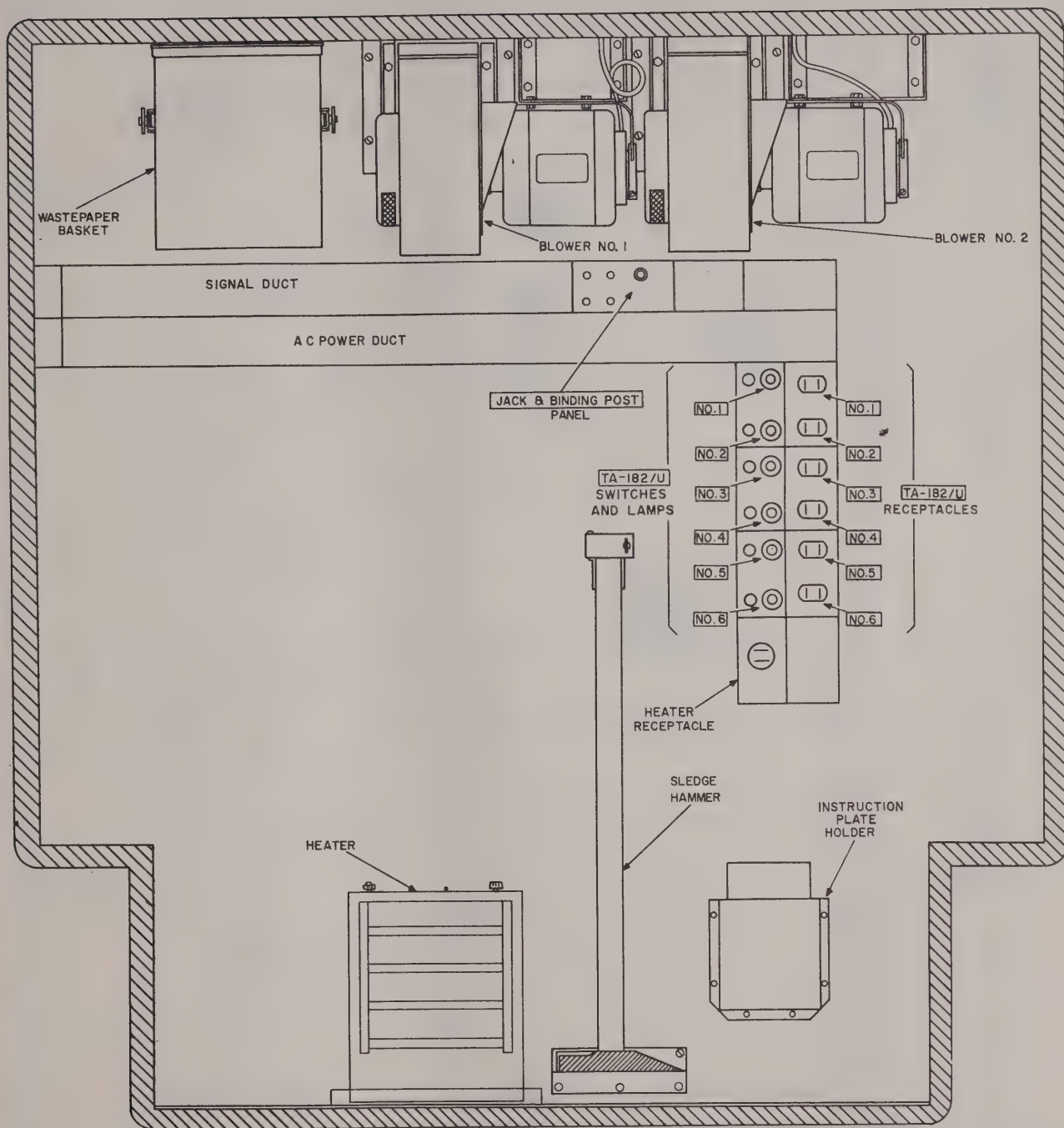
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Figure 6. Shelter, left wall.



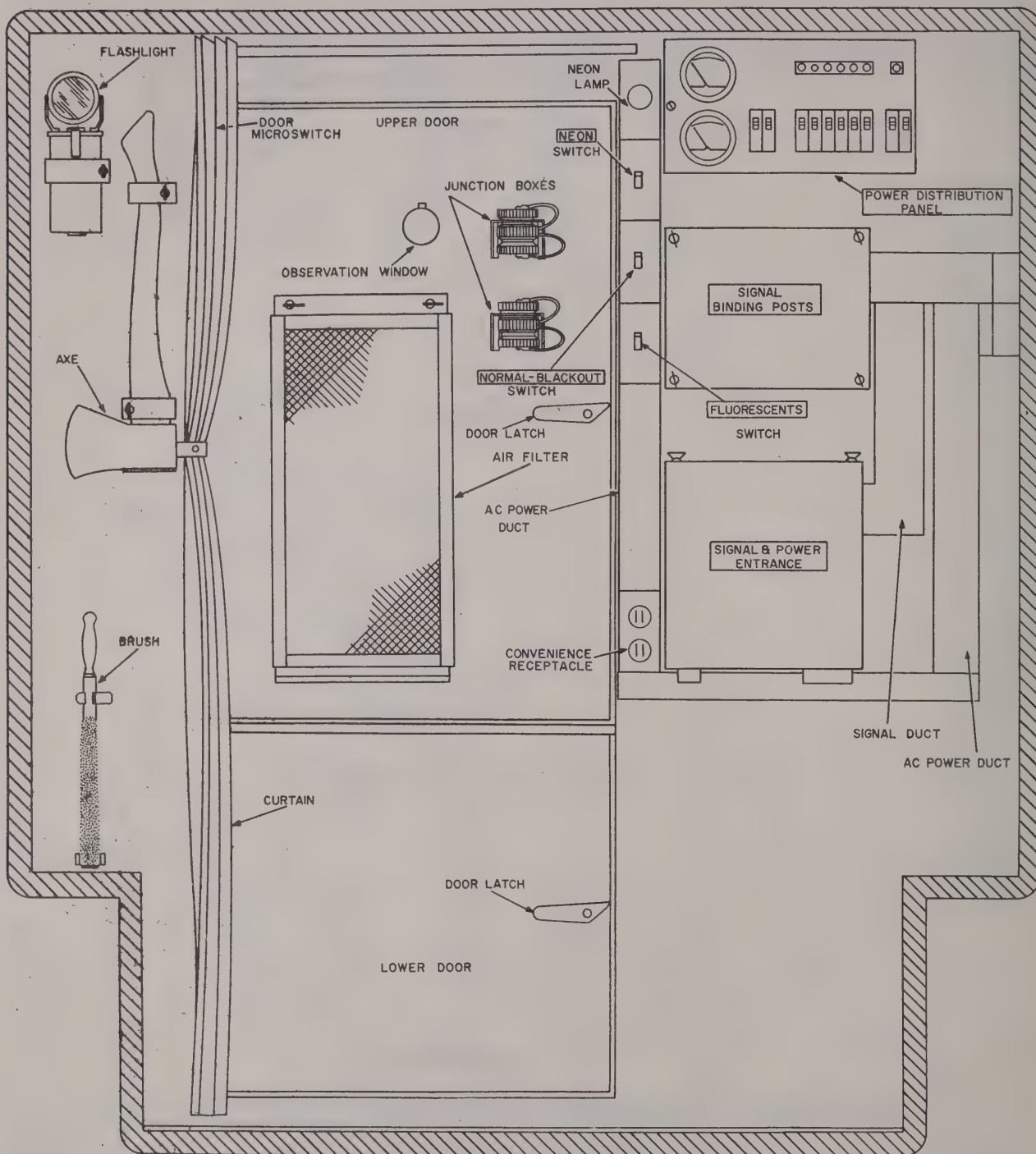
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Figure 7. Shelter, right wall.



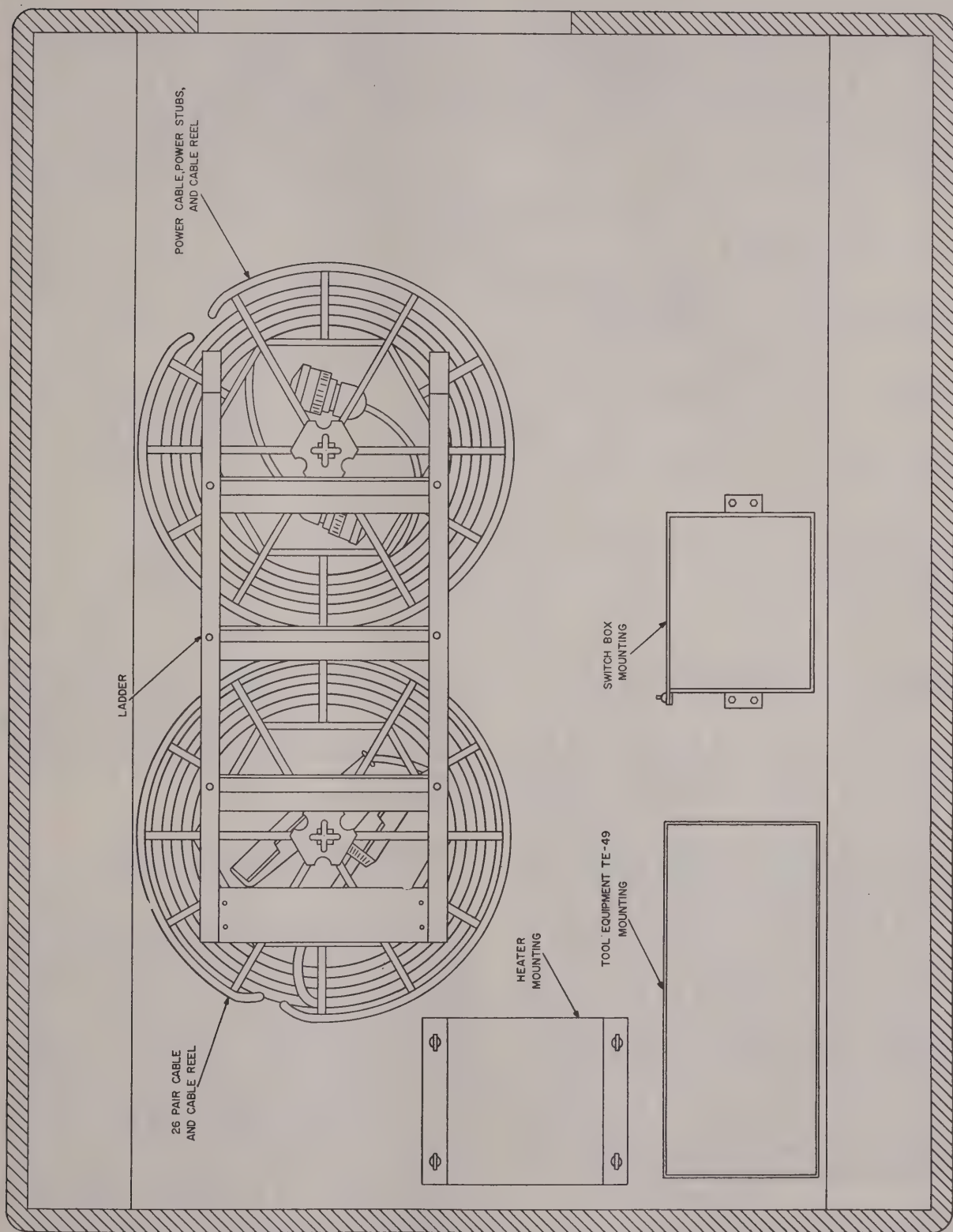
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Figure 8. Shelter, front wall.



TM5815-205-15-9

Figure 9. Shelter, rear wall.



TM5815-205-15-10

Figure 10. Shelter, floor plan.

essary to operate the AN/MGC-17. The generator set consists of two Power Units PE-75-AF mounted in a 3/4-ton, 2-wheel, Cargo Trailer M101. Each power unit has an output of 2,500 watts, single-phase, 60-cycle per second (cps), 120-volt alternating current. A complete description of the generator set is included in TM 11-5805-204-15.

10. SIGNAL BINDING POST Box (fig. 11)

The SIGNAL BINDING POSTS box contains 21 pairs of binding posts which connect to the switchboard, VF ringers, patching panel, and JACK & BINDING POST panel. Except for pairs A and B, the binding posts are in parallel with the contacts of the 26-pair receptacle. The connections are listed in the chart below:

SIGNAL BINDING POSTS box pair No.	SIGNAL & POWER ENTRANCE box SIGNAL 1 receptacle pair No.	Equipment connection	
		Equipment	Binding post
1 through 10	1 through 10	Switchboard	LINE 1 through 10
11	11	TA-182/U 5	LINE 4WS 2W
12	12	TA-182/U 6	LINE 4WS 2W
13 through 18	13 through 18	Patching panel	LINE 13 through 18
19 through 25 (spare)			
LB PHONE	26	JACK & BINDING PCST PANEL.	LB PHONE
BINDING POSTS A	No connection	JACK & BINDING PCST PANEL.	A
BINDING POSTS B	No connection	JACK & BINDING PCST PANEL.	B

11. SIGNAL & POWER ENTRANCE Box (fig. 12)

The SIGNAL & POWER ENTRANCE box contains a 26-pair cable receptacle, (SIGNAL 1), two 115-volt ac power receptacles (POWER IN and POWER OUT), a convenience receptacle (115 VAC), ground lug, and a door-buzzer pushbutton. The SIGNAL 1 receptacle provides connections for circuits between the AN/MGC-17 and the SB-611/MRC. The incoming power to the shelter from the switchbox mounted in the generator set is connected to the POWER IN receptacle. The POWER OUT receptacle can be used to supply power to a second shelter if the output (2,500 watts) of the generator set is not exceeded. A ground lug with a wingnut provides facilities for connecting a ground to the shelter and the equipment. The pushbutton operates the door buzzer to provide an audible signal when the shelter door is locked.

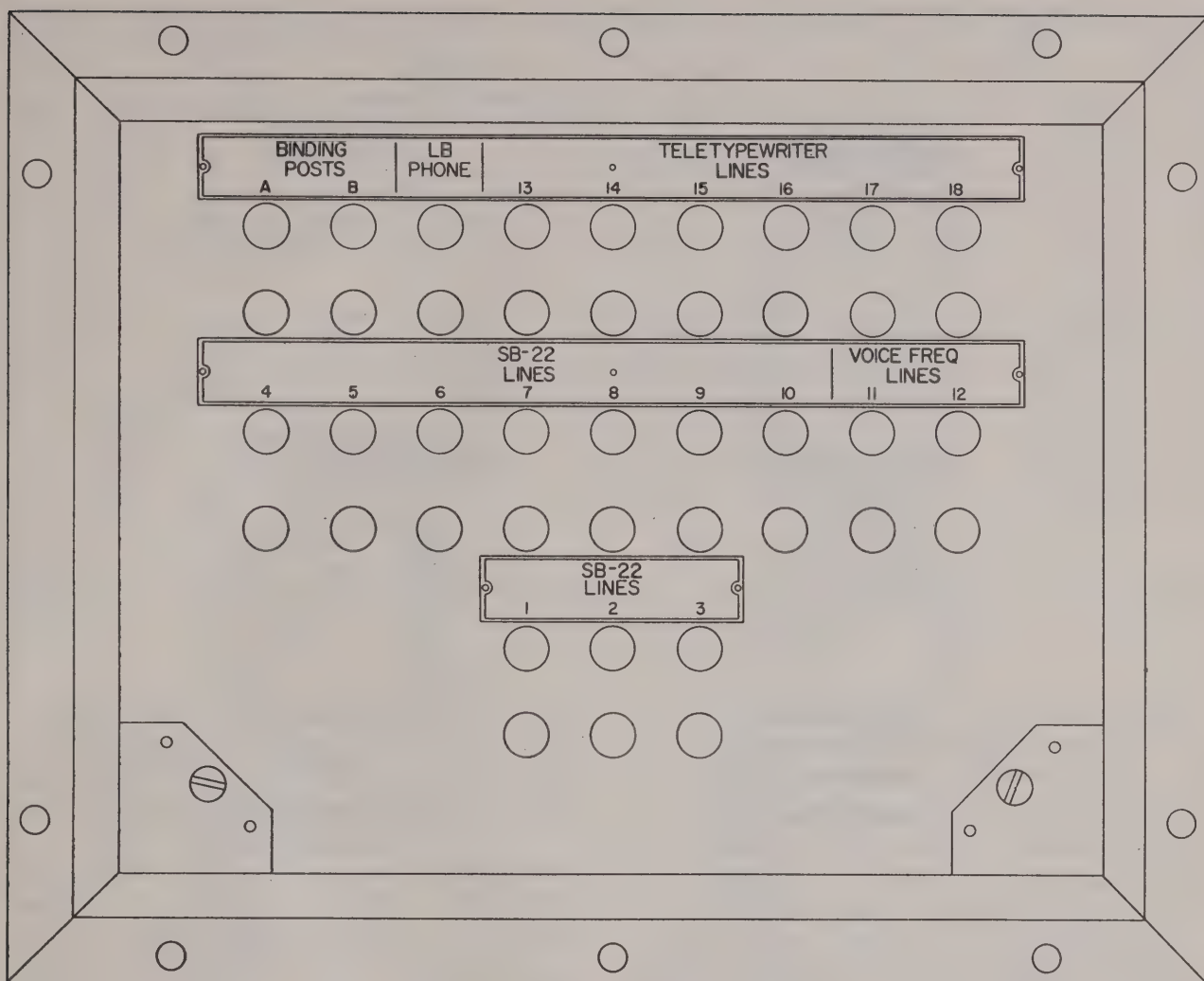
12. Distribution Box J-1077/U (fig. 7)

When not in use, two dropline boxes are

mounted on the right wall of the shelter above and below the TA-182/U's. The dropline boxes are used for testing, as wireheads, and to drop extension circuits from a 26-pair cable. A complete description is included in TM 11-5805-204-15.

13. POWER DISTRIBUTION PANEL (figs. 9 and 13)

The POWER DISTRIBUTION PANEL is mounted on the rear wall directly above the SIGNAL BINDING POSTS box. It is used to control and distribute the ac power supplied to the shelter. Mounted in the panel is an ac ammeter with a full-scale deflection of 50 amperes, a current transformer (not shown), a voltmeter with a 0-150 volts scale, a MAIN circuit breaker rated at 50 amperes, and individual 15-ampere circuit breakers with indicating lamps. The individual circuit breakers control the LIGHTS, OPR POS, BLOWER 1, BLOWER 2, CONVENIENCE RECEPTACLE, and HEATER. A 22 ampere OVERLOAD circuit breaker protects the power unit.



TM5815-205-15-11

Figure 11. SIGNAL BINDING POSTS box.

14. Telegraph Line Control C-2894/TG (fig. 6)

The three line units are used to change the circuits of the TH-5/TG's from two-wire operation to four-wire half-duplex (with home copy), to four-wire full duplex (without home copy), or two-wire speech-plus-half-duplex operation (with home copy). A line unit is installed on the front panel of each TH-5/TG. A complete description of the line unit is included in TM 11-5805-204-15.

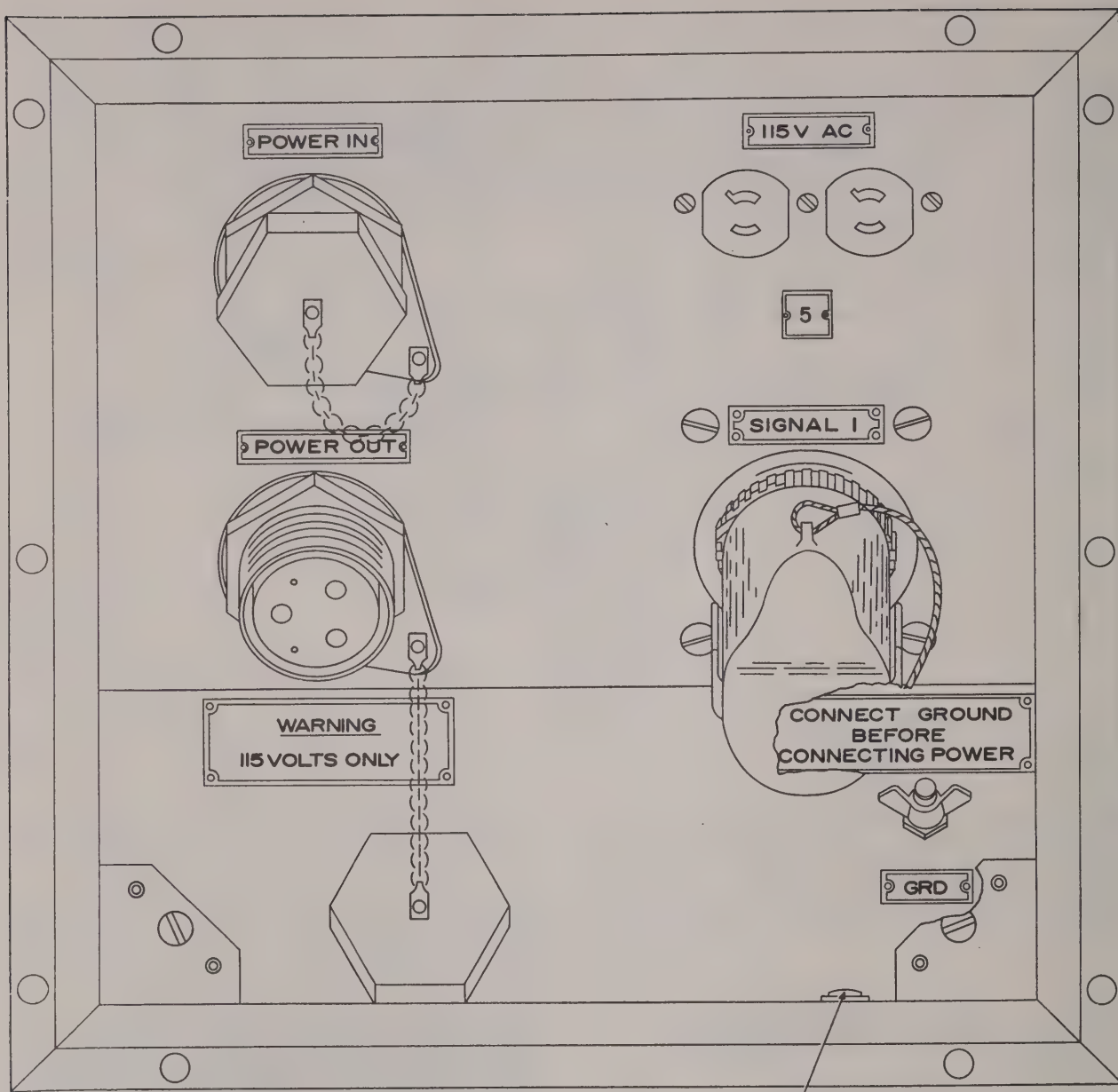
15. Patching Panel (fig. 14)

The patching panel, containing three rows of jacks, is mounted directly below three TH-5/

TG's on the left wall of the shelter. The bottom row of jacks is recessed, and is used to permanently connect the cords and plugs of the TH-5/TG's, TT-76(*)/GGC's, and TT-4(*)/TG into the system. The permanently connected cords and plugs are protected by a hinged cover. The two upper rows of jacks are used for patching interconnections between the TH-5/TG's, TA-182/U's, TT-76(*)/GGC's, TT-4(*)/TG, Communication Security Equipment, and SB-22/PT.

16. Electrical Space Heater HD-375/U (figs. 8 and 10)

The heater is mounted on the floor near the front wall. A switch permits the heating ele-



PUSH BUTTON

TM5815-205-15-12

Figure 12. SIGNAL & POWER ENTRANCE box.

ment and fan to be operated together or the fan to operate alone. A complete description of the heater is included in TM 11-5805-204-15.

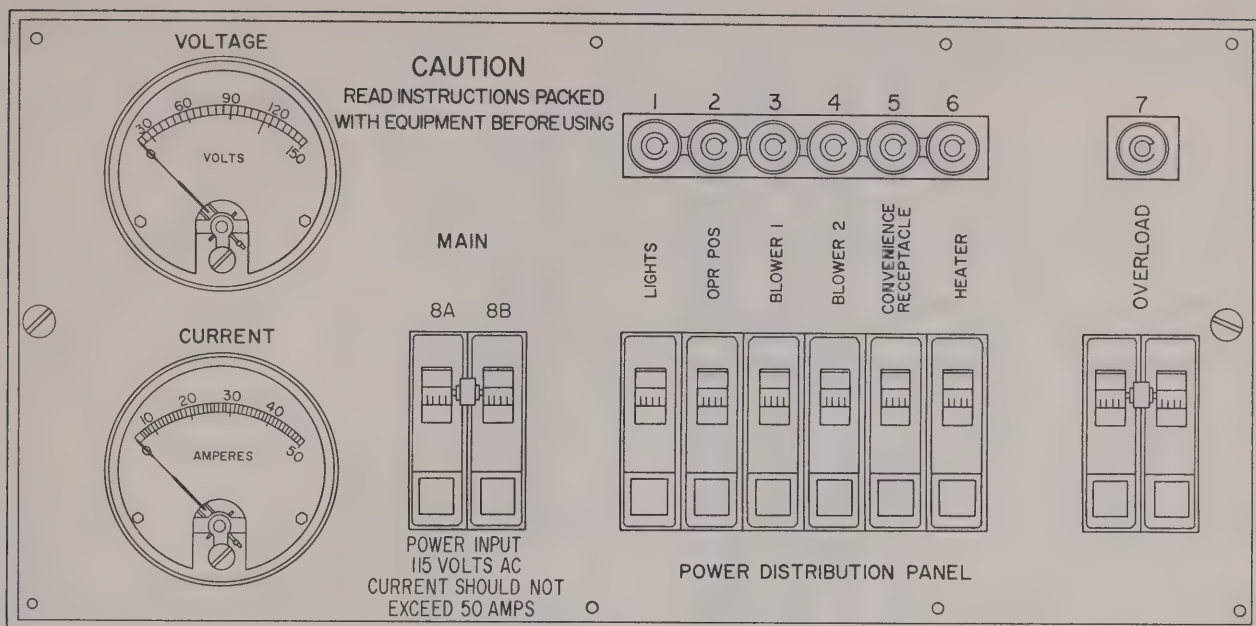
17. JACK & BINDING POST Panel (fig. 8)

The JACK & BINDING POST panel is mounted in the signal duct on the front wall. Two pairs of binding posts (A and B) and a jack (LB PHONE) are mounted on the panel.

The binding posts are connected to the A and B binding posts in the SIGNAL BINDING POSTS box. The LB PHONE jack is connected in parallel with the LB PHONE pair of binding posts in the SIGNAL BINDING POSTS box and with pair 26 of the SIGNAL 1 receptacle in the SIGNAL & POWER ENTRANCE box.

18. Control Box (fig. 15)

The control box contains the three neon lamps



TM5815-205-15-13

Figure 13. POWER DISTRIBUTION PANEL.

removed from the TH-5/TG's and two pushbutton switches. The neon lamps, extensions from the send lamp sockets of each TH-5/TG, indicate when a TH-5/TG is in the send condition. The pushbutton switches permit the sending of plain text when on-line Communication Security Equipment is installed. The control box is mounted on the left wall (fig. 6) in sight and within easy reach of the operator.

19. Safe (fig. 6)

The safe is mounted under the Communication Security Equipment mounting shelf. It is used to store classified material and has a three-combination lock and a thumb latch.

20. Cords and Cables (fig. 2)

a. *Electrical Special Purpose Cable Assembly CX-4768/U*. This cable assembly is a flexible, two-conductor cord used to patch teletypewriter circuits, equipped with a black telephone plug at each end. It is provided in the AN/MGC-17 in lengths of 10 inch, 1 foot 4 inches, 2 feet 4 inches, 4 feet, and 5 feet 6 inches.

b. *Electrical Cord Assembly CX-4695/U (6 ft)*. This cord assembly is a flexible, two-conductor cord used to connect the telephone set

to the JACK & BINDING POST panel. It is equipped with a black telephone plug at one end and prepared leads at the other end.

c. *Electrical Special Purpose Cable Assembly CX-4766/U (4 ft 8 1/4 in.)*. This cable assembly is a flexible two-conductor cord equipped at one end with a black telephone plug and at the other end with spade terminals. It permanently connects the TT-4(*)/TG to the TT-4 BLACK jack in the patching panel.

d. *Electrical Special Purpose Cable Assembly CX-4767/U (4 ft 8 1/4 in.)*. This cable assembly is the same as the CX-4766/U (c above) except it has a red telephone plug and connects to the TT-4 RED jack in the patching panel.

e. *Electrical Special Purpose Cable Assembly CX-4764/U (7 ft 3 in.)*. This cable assembly is a flexible two-conductor cord equipped at one end with a black telephone plug and at the other end with ring terminals. It permanently connects the TT-76(*)/GGC to the TD DC BLACK jack on the patching panel.

f. *Electrical Special Purpose Cable Assembly CX-4765/U (7 ft 8 in.)*. This cable assembly is the same as the CX-4764/U (e above) except it has a red telephone plug and connects to the TD CONTROL RED jack in the patching panel.

g. *Electrical Special Purpose Cable Assembly*

LINE				TA-182				TT-76 NO. 1				TT-76 NO. 2				TT-4									
13	14	15	16	17	18	1	2	3	4	LOCAL	LOCAL	REC	SERIES	TD	SEND	LOCAL	LOCAL	REC	SERIES	TD	SEND	REC	SERIES	TD	SEND
TH-5 LINE				TA-182				TH-5 LINE				CIPHER 1				CIPHER 2				SB-22					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR
TH-5 LINE				TA-182				TH-5 LINE				CIPHER 1				CIPHER 2				SB-22					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR
TH-5 LINE				TA-182				TH-5 LINE				CIPHER 1				CIPHER 2				SB-22					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR	4WS 2W 4WR

SERIES				TH-5 NO. 1				TH-5 NO. 2				TH-5 NO. 3				TT-76 NO. 1				TT-76 NO. 2				TT-4			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		

HINGED COVER

Figure 14. Patching panel.

TM5815-205-15-14

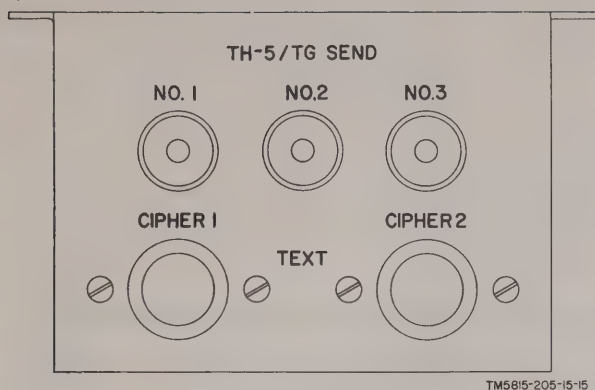


Figure 15. Control box.

CX-4876/U (5 ft 5 in.). This cable assembly is a flexible 11-conductor cable used to connect the security equipment to the CIPHER 1 and CIPHER 2 receptacles in the signal duct. It is equipped with 32-pin plug connectors and dummy receptacles. The dummy receptacles are placed on the connectors to protect the pins when the CX-4876/U is in storage.

21. Organizational Equipment

a. *Manual Telephone Switchboard SB-22/PT (TM 11-2202)*. The switchboard is mounted on the left wall (fig. 6) and is used to switch voice-frequency teletypewriter circuits. The operator's pack is removed and five additional line packs are added, four of which are spares. Line pack 17 is connected to the SB-22 OPR TH-5 on the patching panel and is used as the operator's pack for answering switchboard calls. The switchboard provides 12 teletypewriter lines; two of the lines are equipped with VF ringers.

b. *Teletypewriter Reperforator-Transmitter TT-76(*)/GGC (TM 11-2225)*. The two TT-76(*)/GGC's are mounted on shelves, one above the other, on the left wall (fig. 6). They provide facilities for manual transmission directly from a keyboard, and for tape transmission from a transmitter-distributor. The transmitter-distributor must be modified for security operation (par. 26a). Received messages are printed and perforated on 7/8-inch paper tape.

c. *Teletypewriter TT-4(*)/TG (TM 11-5815-206-12)*. The TT-4(*)/TG is mounted to the left of the TT-76(*)/GGC's (fig. 6). It is a standard communication page-printing tele-

typewriter used to transmit, monitor, and receive messages. It is used primarily with the SB-22/PT.

d. *Telegraph Terminal TH-5/TG (TM 11-2239)*. Three TH-5/TG's are mounted in a rack above the TT-4(*)/TG (fig. 6). They are used for voice-frequency teletypewriter operation. The TH-5/TG is a frequency-shift (fs) carrier modulator and demodulator. It modulates and demodulates 20-milliampere (ma) direct-current (dc) teletypewriter pulses to 1,325 cps (mark) and 1,225 cps (space). It also provides for transmitting and receiving a 20-cps frequency for signaling and breaking purposes.

e. *Telegraph-Telephone Signal Converter TA-182/U (TM 11-2137)*. Six VF ringers are mounted in a rack on the right wall (fig. 7). They provide for signaling in circuits which will not pass 20 cps ringing signals.

f. *Communication Security Equipment TSEC/KW-9 (KAM-10/TSEC and KAO-33/TSEC)*. Provisions are made for mounting two TSEC/KW-9's in a rack located below the switchboard (fig. 6). A complete description of the TSEC/KW-9 is included in KAM-10/TSEC. Operating instructions are included in KAO-33/TSEC.

g. *Range Adapter Test Set TSEC/ST-3*. The TSEC/ST-3 is a test set used in the installation and maintenance of the TSEC/KW-9's. It is mounted on the right wall of the shelter (fig. 7). A complete description and instructions for the test set are included in KAM-10/TSEC.

h. *Teletypewriter Mixer SSM-33 and Transmitter Distributor TT-21/FG*. This Communication Security Equipment is *not* standard in the AN/MGC-17 and will be used only as a secondary system replacing the TSEC/KW-9.

i. *Telephone Set TA-312/PT (TM 11-2155)*. The telephone set (less carrying case) is mounted on the right wall (fig. 7). It is arranged for local battery manual telephone operation and is used for unclassified communication between shelters.

j. *Tool Equipments (fig. 6)*. Tool Equipment TE-33 is stored in the ACCESSORIES & SPARES cabinet. Tool Equipment TE-49 is stored on the floor near the left and front walls. The tool equipments are used for installation and maintenance of the AN/MGC-17.

CHAPTER 2

INSTALLATION AND OPERATION

Section I. INSTALLATION AND INTERCONNECTION OF ORGANIZATIONAL EQUIPMENT

22. Procedures

Usually, the shelter is received without the organizational equipment (par. 5b) installed. To install the organizational equipment, the installation team will follow the procedures given in *a* through *l* below.

Note. If the shelter is received with the organizational equipment installed, unpack and check the equipment (par. 23), perform the preoperational procedures (pars. 38-43), make the necessary signal connections (pars. 44-46), and operate the equipment (pars. 47-53).

- a.* Unpack and check the equipment (par. 23).
- b.* Install the switchboard (par. 24).
- c.* Install the TH-5/TG (par. 25).
- d.* Install the TT-76(*)/GGC (par. 26).
- e.* Install the TT-4(*)/TG (par. 27).
- f.* Install the TSEC/KW-9 (par. 28) or the SSM-33 and TT-21/FG (par. 33).
- g.* Install the VF ringers (par. 29).
- h.* Install the telephone set (par. 30).
- i.* Install the tool equipments (par. 31).
- j.* Install the test set (par. 32).
- k.* Interconnect the installed equipment (par. 34).
- l.* Perform the organizational equipment installations test (pars. 35-37).

23. Unpacking and Checking

Note. When packed for shipment, the shelter of Teletypewriter Central Office AN/MGC-17 is placed in a crate. Shelter uncrating instructions are included in TM 11-5805-204-15.

a. Removing Contents. When preparing the shelter for checking the equipment, proceed as follows:

- (1) Unlock and open the shelter door.
- (2) Unfasten the four web straps which secure the ladder to the cable reels (fig. 10).

- (3) Remove the ladder from the shelter and place it on the ground or against the tail gate of the truck.
- (4) Unscrew the cable reel holders which secure the cable reels to the floor and place them in their mountings (fig. 6).
- (5) Remove the cable reels from the shelter.

b. Checking Contents. Check the contents of the shelter against the list of identifiable components which is contained in the manual holder, (fig. 7). When the component list is not available, the table of components (par. 5) may be used as a general check to indicate the equipment which *probably* was packed.

c. Unpacking and Checking Organizational Equipment. To unpack and check organizational equipments, refer to the appropriate technical manuals (app. I).

24. Installation of Manual Telephone Switchboard SB-22/PT (fig. 6)

The switchboard is secured in its mounting to the left wall. A battery box, mounted below the switchboard mounting, is substituted for the normally used battery compartment in the rear of the switchboard. Connecting cables are long enough to allow the removal of switchboard from the mounting for connection, repairs, or troubleshooting.

a. Connections.

- (1) Place the switchboard in a convenient place under the switchboard mounting with the front facing the left wall and with the rear door hinge at the bottom.
- (2) Open the rear door.
- (3) Feed the cable (from the signal duct)

designated SB-22/PT through the wire entry nearest pair 17 binding posts of the switchboard.

(4) The wire leads are paired and num-

bered 1 through 12, 17, NA, and GRD. Connect the wires to the switchboard binding posts as indicated in the chart below:

Binding post pair No.	SB-22/PT cable			
	Upper binding post		Lower binding post	
	Wire No.	Color	Wire No.	Color
1	1	White	1	Yellow
2	2	White	2	Orange
3	3	White	3	Black
4	4	White	4	Pink
5	5	White	5	Light brown
6	6	White	6	Dark brown
7	7	White	7	Silver
8	8	White	8	Dark green
9	9	White	9	Light green
10	10	White	10	Violet
11	11	White	11	Slate
12	12	White	12	Light blue
17	13	Brown	13	Black
NA	NA	Violet		
GND			17	Black

(5) Close the rear door.

b. Installation.

- (1) Turn the SB-22/PT around and remove the cover.
- (2) Lift and insert the SB-22/PT into its mounting.
- (3) Engage the snap catches of the mounting in the D-rings on the underside of the SB-22/PT and secure the snap catches.
- (4) Remove the operator's pack from the SB-22/PT.
- (5) Remove the three line packs from the accessory kit. Obtain two additional line packs. Install the five line packs in the switchboard.
- (6) The accessory kit may be supplied in either a canvas case or a metal box. Store as described in (a) or (b) below.
 - (a) Place Accessory Kit MX-230/PT (canvas case) in the ACCESSORIES & SPARES cabinet.
 - (b) Place Accessory Kit MX-230A/PT (metal box) in the mounting on the right wall (fig. 7) and secure with metal strap and fastener.

(7) Install two Batteries BA-30 in the NIGHT ALARM BATTERY box as follows:

- (a) Open the cover of the battery box.
- (b) Insert the left battery with its center terminal at the top against the spring; insert the right battery with the center terminal at the bottom against the positive (+) binding post.
- (c) Close and fasten the cover.

25. Installation of Telegraph Terminal TH-5/TG

Before installing the TH-5/TG's in the AN/MGC-17, install a line unit on each TH-5/TG. Refer to TM 11-5805-204-15 for line unit installation and connection instructions.

a. Installation. Install the three TH-5/TG's as follows:

- (1) Remove the cover from each TH-5/TG.
- (2) Remove the fuses from each cover and place them in the fuse holder on the left wall (fig. 6).
- (3) Remove a set of instruction plates from inside one of the covers and place

them in the instruction plate holder on the front wall (fig. 8).

- (4) Remove the cable clamps, locking nuts, retaining end, and center brackets from the threaded rods on the TH-5/TG mounting rack (fig. 6). Also, remove the nuts which help secure the brackets on the rods before the TH-5/TG's are installed.
- (5) Place TH-5/TG NO. 1 in the rack (fig. 6) and connect the lamp (E9) socket to wires from the signal duct (*b*(1) below). Replace the retaining end bracket on the rod. Position the bracket over the left edge of the TH-5/TG. Replace the locking nut fingertight.
- (6) Place TH-5/TG NO. 2 in the rack and connect the lamp (E9) socket to the wires from the signal duct (*b*(1) below). Position the center bracket over the adjacent edges of TH-5/TG's NO. 1 and NO. 2. Replace the locking nut fingertight.
- (7) Place TH-5/TG NO. 3 in the rack and connect the lamp (E9) socket to the wires from the signal duct (*b*(1) below). Position the remaining center bracket over the adjacent edges of TH-5/TG NO. 2 and NO. 3 and position the end bracket over the right edge of TH-5/TG NO. 3. Replace the locking nuts fingertight.
- (8) Use a wrench to tighten all four locking nuts; do not overtighten.
- (9) Replace the cable clamps.
- (10) Remove the lamp caps from the TH-5/TG's and place them in the ACCESSORIES & SPARES cabinet.
- (11) Remove the neon lamps from the TH-5/TG's and place them in the lamp sockets on the control box (fig. 15).

b. Connections. Connect the TH-5/TG as follows:

- (1) Connect the cable (from the signal

duct) designated TH-5/TG to each TH-5/TG lamp (E9) socket. The wire leads with pairs designated NO. 1, NO. 2, and NO. 3 connect to NO. 1, NO. 2, NO. 3, respectively.

- (2) Connect the cords (from the line unit) to the patching panel as described in paragraph 34*a*.
- (3) Connect the power cords to the TH-5/TG NO. 1, TH-5/TG NO. 2, and TH-5/TG NO. 3 receptacles in the ac power duct (fig. 6) and arrange the power cords neatly, use the cable clamps.

26. Installation of Teletypewriter Reperforator-Transmitter TT-76(*)/GGC

a. Modification (figs. 16 and 17). Before installing the TT-76(*)/GGC, modify the transmitter-distributor as follows:

- (1) Remove the cover from the transmitter-distributor (TM 11-2225).
- (2) Remove the replacement cover, two cable clamps, and Electrical Special Purpose Cable Assemblies CX-4764/U (7 ft 8 in.) and CX-4765/U (7 ft 8 in.) from the ACCESSORIES & SPARES cabinet.
- (3) Feed cable assembly CX-4764/U through the lower grommet in the rear of the replacement cover and feed cable assembly CX-4765/U through the upper grommet.
- (4) Secure the cables with the cable clamps; use existing screws and loop the cables as shown in figures 16 and 17.
- (5) When modifying a TT-76/GGC, follow the procedures given in the chart in (*a*) below and refer to figure 16. When modifying a TT-76A/GGC, follow the procedures given in the chart in (*b*) below and refer to figure 17.

(a) TT-76/GGC.

Wire	Remove from terminal	Connect to terminal
Brown-white	4 on TB1	6 on TB 1
Green-red	5 on TB1	8 on TB 1
Brown-black	Upper right terminal on switch S2	Upper left terminal on switch S2
Strap	5 and 7 on TB 1	10 and 11 on TB 1
Strap	4 and 6 on TB 1	10 and 11 on TB 1
White wire of CX-4765/U (red plug).		8
Black wire of CX-4765/U (red plug).		7
White wire of CX-4764/U (black plug).		5
Black wire of CX-4764/U (black plug).		4

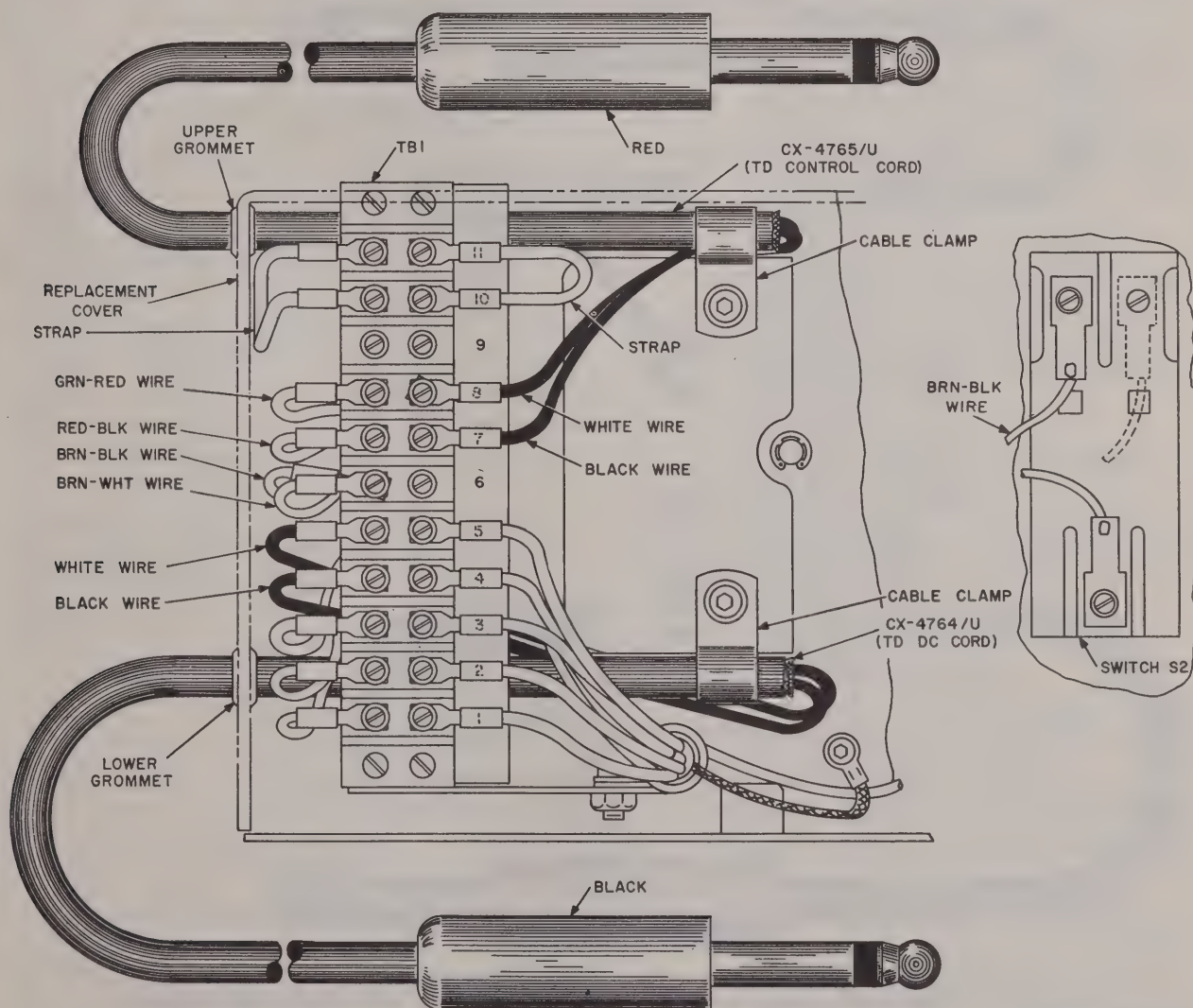
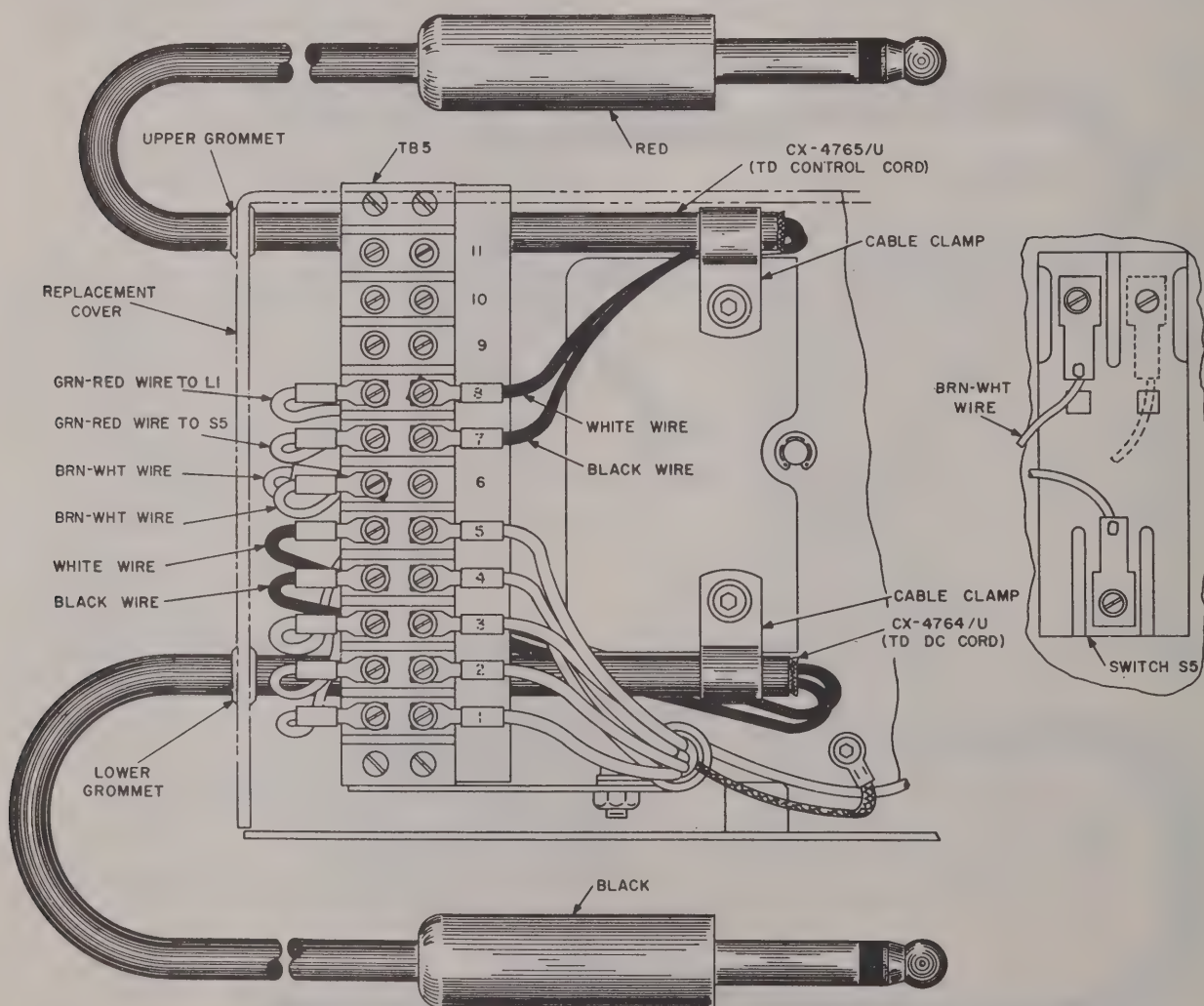


Figure 16. Teletypewriter Reperforator-Transmitter TT-76/GGC, wiring modification diagram.

TM5815-205-15-16

(b) TT-76A/GGC.

Wire	Remove from terminal	Connect to terminal
Brown-white (2 wires) -----	4 on TB 5 -----	6 on TB 5
Green-red to L1 -----	5 on TB 5 -----	8 on TB 5
Green-red to S5 -----	5 on TB 5 -----	7 on TB 5
Brown-white -----	Upper right terminal on switch S5 -----	Upper left terminal on switch S5
White wire of CX-4765/U (red plug). -----	-----	8
Black wire of CX-4765/U (red plug). -----	-----	7
White wire of CX-4764/U (black plug). -----	-----	5
Black wire of CX-4764/U (black plug). -----	-----	4



TM5815-205-15-17

Figure 17. Teletypewriter Reperforator-Transmitter TT-76A/GGC, wiring modification diagram.

- (6) Install the replacement cover.
- (7) Upon completion of the modification, attach a pressure-sensitive label marked CAUTION MODIFIED PER TM 11-5815-204-15. Proceed as follows:

- (a) Remove a pressure-sensitive label from the ACCESSORIES & SPARES cabinet.
- (b) Peel the protective cover from the back of the label and attach the label to the cover of the TT-76(*)/GGC.
- (c) Apply pressure to the label to insure complete adhesion.

b. Installation. The two TT-76(*)/GGC's shown in figure 6 are installed on mounting shelves. The shelves mount the base plate of either a TT-76/GGC or TT-76A/GGC. Install the upper TT-76(*)/GGC first. Remove the wastepaper basket from its holder, then follow the procedures given below:

Note. Omit (5) through (8) below when installing a TT-76A/GGC.

- (1) Remove the bolts, nuts, and lockwashers from the shelf.
- (2) Place the TT-76(*)/GGC on the shelf. Aline the holes in the base of the equipment with the holes in the shelf.
- (3) Insert the bolts down through the bushings on the base plate. On the right side, the cover must be raised to locate the bushings.
- (4) Secure the TT-76(*)/GGC to the shelf by using the bolts, nuts, and lockwashers.
- (5) Remove the four screws that secure the plate containing the power switches to the TT-76/GGC and the four screws that secure the plate containing the selector switches (TM 11-2225).
- (6) Lift each plate carefully and insert the bolts through the holes in the base plate and mounting shelf.

Caution: Be careful not to break off the attached leads when lifting the plates.

- (7) Secure each bolt by using the lockwasher and nuts.
- (8) Replace the two plates.

- (9) Pull the lower shelf out on its slides and install the second TT-76(*)/GGC ((1) through (8) above).
- (10) Install the tape guide on the upper TT-76(*)/GGC (TM 11-2225).
- (11) Install the tape guide and chad bin assembly on the lower TT-76(*)/GGC and shelf (TM 11-2225).
- (12) Ground the power supply as follows:
 - (a) If a TT-76/GGC is supplied, connect the ground lead at the end of the power cord to the grounding lug on the ac duct near the TT-76/GGC outlets.
 - (b) On the TT-76A/GGC, the power cord is fitted with a three-pronged plug. Remove the screws that secure the third prong to the plug and turn the prong so it points opposite to the other two prongs. Disconnect the ground lead fastened to the third prong and connect it to the grounding lug on the ac duct near the TT-76(*)/GGC outlets.
- (13) Operate the POWER switch on left side of each keyboard to the OFF position and connect the power cord from each TT-76(*)/TGG to its respective receptacle TT-76 No. 1 or TT-76 No. 2.

27. Installation of Teletypewriter TT-4(*)/TG

Before installing the TT-4(*)/TG on its mounting shelf (fig. 6), two cable assemblies must be connected to the terminal board (TM 11-5815-206-12).

a. Connections.

- (1) Remove the dust cover.
- (2) Disconnect the shortening bar from SEND terminal 2 on the terminal board of the TT-4(*)/TG.
- (3) Check to insure that BATTERY terminals 5 and 6 are connected by a shortening bar.
- (4) Operate the VOICE FREQ. LINE-DC. LINE toggle switch (TM 11-5815-206-12) to VOICE FREQ. LINE.
- (5) Remove Electrical Special Purpose Cable Assemblies CX-4766/U (4 ft

8 $\frac{1}{4}$ in.) and CX-4767/U (4 ft 8 $\frac{1}{4}$ in.) from the ACCESSORIES & SPARES cabinet and connect them to the line terminal board as follows:

Cable	Wire color	Terminal	No.
CX-4766/U (black plug).	Black	Send	1
	White	Send	2
CX-4767/U (red plug).	Black	Rec	3
	White	Rec	4

- (6) Insert the cable assemblies ((5) above) and power cord in the cable bracket on the rear of the machine and replace the dust cover (TM 11-5815-206-12).

b. Installation.

- (1) Place the TT-4(*)/TG on its mounting shelf and position it so the rear edge of the TT-4(*)/TG base is under the bracket clamps at the rear of the shelf.
- (2) Place the fasteners on the front of the shelf over the edge of the TT-4(*)/TG base and turn the fasteners.
- (3) Connect the ground lead of the power cord plug of the TT-4(*)/TG to the ground terminal under the TT-4 receptacle (fig. 5) on the ac power duct.
- (4) Check to see that the motor switch is in the OFF position.
- (5) Connect the power cord plug to the TT-4 receptacle in the ac power duct (fig. 6).

28. Installation of Communication Security Equipment TSEC/KW-9

The mounting rack has two sliding shelves (fig. 6) for mounting TSEC/KW-9. TSEC/KW-9 is received in re-usable shipping cases. Remove the equipments from their cases. Store the cases on top of the shelter or in the trailer of the generator set. Install and connect the security equipment as follows:

- a.* Release the two TRANSIT LOCK fasteners and slide out the lower shelf.
- b.* Place the TSEC/KW-9 on the shelf with the four tapped holes in the base directly over the four holes in the shelf.

c. Secure the TSEC/KW-9 to the shelf with the screws and washers stored in the TSEC/KW-9 accessories case and spares cabinet. The screws are stored in the spares cabinet.

d. Remove Electrical Special Purpose Cable Assembly CX-4876/U (5 ft 5 in.) from the ACCESSORIES & SPARES cabinet and remove the protective covers from the plugs.

e. Insert one end of the cable into receptacle J101 on the left rear of the TSEC/KW-9.

f. Remove the TELETYPE ONLY plug from the CIPHER 2 receptacle in the signal duct and insert the loose end of the cable into the receptacle.

g. Insert the power cord plug into the CIPHER 2 receptacle in the ac power duct. For storage, plug the TELETYPE ONLY plugs into the dummy receptacles.

h. Slide the shelf back into position and secure it with the TRANSIT LOCK fasteners.

i. Release the two TRANSIT LOCK fasteners and slide out the upper shelf.

j. Place the other TSEC/KW-9 on the shelf with the four tapped holes in the base directly over the four holes in the shelf.

k. Secure the TSEC/KW-9 to the shelf by using the screws and washers stored in the TSEC/KW-9 accessories case.

l. Remove Electrical Special Purpose Cable Assembly CX-4876/U (5 ft 5 in.) from the ACCESSORIES & SPARES cabinet and remove the protective covers from the plugs.

m. Insert one end of the cable into receptacle J101 on the left rear of the TSEC/KW-9.

n. Remove the TELETYPE ONLY plug from the CIPHER 1 receptacle in the signal duct and insert the loose end of the cable into the receptacle.

o. Insert the power cord plug into the CIPHER 1 receptacle in the ac power duct.

p. Slide the shelf back into position and secure it with the TRANSIT LOCK fasteners.

29. Installation of Telegraph-Telephone Signal Converter TA-182/U (fig. 7)

a. Installation. Install the six TA-182/U's as follows:

- (1) Remove the covers from the TA-182/U's (TM 11-2137).
- (2) Remove the fuses from the covers and place them in the fuse holder on the left wall (fig. 6).
- (3) Remove one set of the instruction plates from inside of one of the covers and place it in the instruction holder on the front wall (fig. 8).
- (4) Remove the cable clamps, locknuts, retaining end, and center brackets from the threaded rods in the TA-182/U mounting rack. Also, remove the nuts which help secure the brackets to the rods before the TA-182/U's are installed.
- (5) Place TA-182/U No. 5 in the rack (fig. 7) and replace the retaining end bracket on the rod. Position the bracket over the left edge of the TA-182/U No. 5. Replace the locknut fingertight.
- (6) Place TA-182/U No. 6 in the rack. Position the center bracket over the edges of TA-182/U's No. 5 and No. 6

and the end bracket over the right edge of TA-182/U No. 6. Replace the locknuts fingertight.

- (7) Use a wrench and tighten all three locknuts; do not overtighten.
- (8) Replace the cable clamps.
- (9) Follow the procedures in (5) through (8) above to install TA-182/U's in positions No. 3, 4, 1, and 2, respectively.
- (10) Remove six identification holders from the ACCESSORIES & SPARES cabinet.
- (11) Use a screw driver and loosen the upper right fastener on each TA-182/U (fig. 7) and slip the proper identification holder under the fastener.
- (12) Tighten the fastener.

b. Connection. The connections to the binding posts on each of the BF ringers are identical.

- (1) Connect the cables (from the signal duct) designated TA-182/U 1 through 6 to the TA-182/U's as described in the chart below:

Cable	Wire lead	Color	Connect to TA-182/U No.	TA-182/U binding posts
TA-182/U 1	1	White	1	LINE 1 4WS 2W
	2	Yellow	1	LINE 2 4WS 2W
	5	White	1	LOOP 5 4WR 2W
	6	Orange	1	LOOP 6 4WR 2W
TA-182/U 2	1	White	2	LINE 1 4WS 2W
	2	Black	2	LINE 2 4WS 2W
	5	White	2	LOOP 5 4WR 2W
	6	Pink	2	LOOP 6 4WR 2W
TA-182/U 3	1	White	3	LINE 1 4WS 2W
	2	Light brown	3	LINE 2 4WS 2W
	5	White	3	LOOP 5 4WR 2W
	6	Dark brown	3	LOOP 6 4WR 2W
TA-182/U 4	1	White	4	LINE 1 4WS 2W
	2	Silver	4	LINE 2 4WS 2W
	5	White	4	LOOP 5 4WR 2W
	6	Dark green	4	LOOP 6 4WR 2W
TA-182/U 5	1	White	5	LINE 1 4WS 2W
	2	Slate	5	LINE 2 4WS 2W
	5	White	5	LOOP 5 4WR 2W
	6	Slate	5	LOOP 6 4WR 2W
TA-182/U 6	1	White	6	LINE 1 4WS 2W
	2	Light blue	6	LINE 2 4WS 2W
	5	White	6	LOOP 5 4WR 2W
	6	Light blue	6	LOOP 6 4WR 2W

- (2) Operate all TA-182/U switches on the front wall (fig. 8) to the OFF position. Insert each power cord plug into its proper TA-182/U receptacle.
- (3) Arrange the power cords neatly in the cable clamps.

30. Installation of Telephone Set TA-312/PT (fig. 7)

Install the telephone set on the right wall as follows:

- a. Open the telephone clamp on the wall mounting.
- b. Remove the telephone set from its canvas carrying case.
- c. Place the telephone set in the holder. Remove the handset from the handset bracket.
- d. Replace and fasten the telephone clamp over the telephone set.
- e. Replace the handset in the handset bracket and fasten the handset strap over the handset.
- f. Remove the telephone cord from the ACCESSORIES & SPARES cabinet.
- g. Connect the leads of the telephone cord to the telephone set binding posts.
- h. Insert the plug of the telephone cord in the LB PHONE jack on the JACK & BINDING POST panel (fig. 8).

31. Tool Equipment

- a. *Tool Equipment TE-49.* Place Tool Equipment TE-49 in its storage mounting (fig. 10) and fasten the web straps.
- b. *Tool Equipment TE-33.* Place two Tool Equipments TE-33 in the ACCESSORIES & SPARES cabinet.

32. Installation of Range Adapter Test Set TSEC/ST-3 (fig. 7)

- a. Place the TSEC/ST-3 case in the storage mounting with its carrying handle upright.
- b. Place the metal strap over the front of the case and under the carrying handle.
- c. Secure the fastener.

33. Installation of Teletypewriter Mixer SSM-33 and Transmitter Distributor TT-21/FG

SSM-33 and TT-21/FG are not standard

equipments and should only be used as a secondary system in place of the two TSEC/KW-9's. When this secondary system is supplied, install as described in *a* through *k* below.

a. If TSEC/KW-9's are already installed, remove them by reversing the procedure in paragraph 28.

b. Remove the six screws that secure the lower sliding shelf to the mounting rack. Remove the shelf and, together with the screws, store in a convenient location.

c. Install the SSM-33 in the space from which the lower sliding shelf was removed. Place the two mounting angles attached to the SSM-33 against the legs of the mounting rack so the holes in the mounting angles are in line with the tapped holes in the legs. Secure the SSM-33 with the six screws and washers in the accessory case.

d. Mount two TT-21/FG's side by side on the top sliding shelf with the outer edges fitting under the two channels attached to the sides of the sliding shelf.

e. Remove the mounting channel from the ACCESSORIES & SPARES cabinet and place it between the two TT-21/FG's; line the threaded holes in the channel with the holes in the sliding shelf. Engage the two notches in the channel with the rim on each TT-21/FG base.

f. Secure the mounting channel by using the screws supplied.

g. Install a rectifier in the AN/MGC-17; use PP-1209/FG, or equivalent.

h. Fabricate a cable by using the TELETYPE ONLY plug and the parts shown on figure 26. Add resistors and wire to plug and rectifier. Connect the cable to the SSM-33.

i. Insert the plug into CIPHER 1 receptacle.

j. Connect power and signal cables from TT-21/FG to SSM-33.

k. Plug the power cord from the SSM-33 into the 115-volt receptacle CIPHER 1.

34. Connection of TH-5/TG's, TT-4(*)/TG, and TT-76(*)/GGC's to Patching Panel

The cords and plugs which are to be permanently connected to jacks of the patching panel must be inserted through the right side entry of the panel and routed to the front of

panel before being plugged into the proper jacks. Open the cover on the lower row of jacks before beginning operation.

a. Telegraph Terminals TH-5/TG. Connect the cords attached to the three TH-5/TG's as indicated in the chart below.

Equipment		Patching panel jack
Type No.	Plug	
TH-5/TG NO. 1	Red	TH-5 NO. 1 LINE RED
TH-5/TG NO. 1	Black	TH-5 NO. 1 LINE BLACK
TH-5/TG NO. 2	Red	TH-5 NO. 2 LINE RED
TH-5/TG NO. 2	Black	TH-5 NO. 2 LINE BLACK
TH-5/TG NO. 3	Red	TH-5 NO. 3 LINE RED
TH-5/TG NO. 3	Black	TH-5 NO. 3 LINE BLACK

b. Teletypewriter TT-4()/TG.* Connect the cords attached to the TT-4(*)/TG as indicated in the chart below.

Equipment		Patching panel jack
Type No.	Plug	
TT-4(*)/TG	Red	TT-4 RED
TT-4(*)/TG	Black	TT-4 BLACK

c. Teletypewriter Reperforator-Transmitters TT-76()/GGC.* Remove two Electrical Special Purpose Cable Assemblies CX-4768/U (5 ft. 6 in.) from the ACCESSORIES & SPARES cabinet. Insert one end of each CX-4768/U into the TR jack on the right side of each TT-76(*)/GGC (TM 11-2225). Connect the cords attached to the two TT-76(*)/GGC's as indicated in the chart below:

Equipment		Patching panel jack
Type No.	Plug	
TT-76(*)/GGC NO. 1	CX-4765/U (red plug)	TD 1 CONT RED
TT-76(*)/GGC NO. 1	Red REC	TT-76 NO. 1 REC RED
TT-76(*)/GGC NO. 1	Black TR send	TT-76 NO. 1 SEND BLACK
TT-76(*)/GGC NO. 1	Gray TD send	TT-76 NO. 1 TD GRAY
TT-76(*)/GGC NO. 1	CX-4764/U (black plug)	TT-76 NO. 1 TD DC BLACK
TT-76(*)/GGC NO. 1	CX-4768/U	TT-76 NO. 1 TR
TT-76(*)/GGC NO. 2	CX-4765/U (red plug)	TD 2 CONT RED
TT-76(*)/GGC NO. 2	Red REC	TT-76 NO. 2 REC RED
TT-76(*)/GGC NO. 2	Black TR send	TT-76 NO. 2 SEND BLACK
TT-76(*)/GGC NO. 2	Gray TD send	TT-76 NO. 2 TD GRAY
TT-76(*)/GGC NO. 2	CX-4764/U (black plug)	TT-76 NO. 2 TD DC BLACK
TT-76(*)/GGC NO. 2	CX-4768/U	TT-76 NO. 2 TR

35. Organizational Equipment Installation Test

Perform the following preliminary procedures (*a* through *n* below), check the ground (par. 25) and power (par. 26) connections, check test procedures for nonsecure teletypewriter operation

(par. 36), and check test procedures for secure teletypewriter operation (par. 37).

a. Energize the ac circuits (par. 43).

b. Check to see that the power switches of the organizational equipment are in the OFF position.

c. Perform the preliminary starting and pre-setting procedures for the TT-4(*)/TG and TT-76(*)/GGC's as described in their technical manuals (app. I).

d. Operate the OPR POS circuit breaker on the POWER DISTRIBUTION PANEL to the ON position.

e. Check to see that the neon lamp above the circuit breaker is lighted.

f. Perform the starting procedures for the TT-4(*)/TG and TT-76(*)/GGC's as described in their technical manuals (app. I).

g. Test the TT-4(*)/TG and TT-76(*)/GGC's as described in their technical manuals (app. I).

h. Operate the SEND-REC-NORM switch on all TH-5/TG's to the NORM position.

i. Operate the TP-TG switch on all VF ringers to TG.

j. Operate the 2W-4W switch on all VF ringers to 2W.

k. Operate the three TH-5/TG switches (fig. 6) to the ON position.

l. Check to see that the neon lamp corresponding to each TH-5/TG switch is lighted.

m. Operate all TA-182/U switches (fig. 8) to the ON position.

n. Check to see that the neon lamp corresponding to each TA-182/U switch is lighted.

36. Nonsecure Teletypewriter Operation, Testing Procedures

a. Test Setup.

- (1) Check to be sure that all permanent patches between the TH-5/TG's, TT-76(*)/GGC's, TT-4(*)/TG, and patching panel (par. 34) have been properly connected.
- (2) On each TH-5/TG (No. 1, No. 2, and No. 3), operate the 4W-2W-TEL switch to the 2W position.
- (3) On the line unit of each TH-5/TG, operate the 4W FULL DUPLEX-NORMAL switch to the NORMAL position and the 2W SPEECH PLUS 4W-NORMAL 2W-4W switch to the NORMAL 2W position.
- (4) Make the following connections from the equipment to the patching panel:

Equipment		Patching panel jack
Type No.	Jack	
TH-5/TG NO. 1	LOOP SEND	TT-76 NO. 1 SEND
TH-5/TG NO. 1	LOOP SEND	TT-76 NO. 1 TD
TH-5/TG NO. 1	LOOP REC	TT-76 NO. 1 REC
TH-5/TG NO. 2	LOOP SEND	TT-76 NO. 2 SEND
TH-5/TG NO. 2	LOOP SEND	TT-76 NO. 2 TD
TH-5/TG NO. 2	LOOP REC	TT-76 NO. 2 REC
TH-5/TG NO. 3	LOOP SEND	TT-4 SEND
TH-5/TG NO. 3	LOOP REC	TT-4 REC

- (5) Make the following patches between the jacks on the patching panel:

Patching panel	
From jack	To jack
TH-5 LINE 1 4WS 2W	TA-182 LOOP 1
TH-5 LINE 2 4WS 2W	TA-182 LOOP 2
TA-182 LINE 1	TA-182 LINE 2
TH-5 LINE 3 4WS 2W	SB-22 OPR TH-5

b. Ringing Test.

- (1) On TH-5/TG No. 1, operate the RING switch. The buzzer on TH-5/TG No. 2 should sound.
- (2) On the TH-5/TG No. 2, operate the RING switch. The buzzer on TH-5/TG No. 1 should sound.
- (3) On TH-5/TG No. 3, operate the RING switch. The drop on line 17 on the switchboard should operate.
- (4) Move the following plugs on the patching panel:

Patching panel	
From jack	To jack
TA-182 LOOP 1	TA-182 LOOP 3
TA-182 LOOP 2	TA-182 LOOP 4
TA-182 LINE 1	TA-182 LINE 3
TA-182 LINE 2	TA-182 LINE 4

- (5) Repeat (1) and (2) above.
- (6) Use field wire and strap binding posts pair 11 to pair 12 (top to top; bottom to bottom) on the SIGNAL BINDING POSTS box.
- (7) On the switchboard, insert the plug of line 17 into the jack of line 11.
- (8) On TH-5/TG No. 3, operate the RING switch. The drop on line 12 on the switchboard should operate.
- (9) Remove the plug of line 17 from jack of line 11 and insert it into the jack of line 12.
- (10) On TH-5/TG No. 3, operate the RING switch. The drop on line 11 on the switchboard should operate.
- (11) Restore the switchboard to normal.

c. Transmission Test.

- (1) Transmit from the keyboard or transmitter-distributor of TT-76(*)/GGC No. 1. Copy of the message should be received on the reperforator of TT-76(*)/GGC No. 1 and No. 2.
- (2) Transmit from the keyboard of transmitter-distributor of TT-76(*)/GGC No. 2. Copy of the message should be received on the reperforator of TT-76(*)/GGC No. 1 and No. 2.
- (3) Change the following patches on the patching panel:

Patching panel	
From jack	To jack
TA-182 LOOP 3	TA-182 LOOP 1
SB-22 OPR TH-5	TA-182 LOOP 2
TA-182 LINE 3	TA-182 LINE 1
TA-182 LINE 4	TA-182 LINE 2

- (4) Transmit from the keyboard of the TT-4(*)/TG. Copy of the message should

be received on the reperforator of the TT-76(*)/GGC No. 1 and on the TT-4(*)/TG.

- (5) Transmit from the keyboard or transmitter-distributor of TT-76(*)/GGC No. 1. Copy of the message should be received on the TT-4(*)/TG, and on the reperforator of the TT-76(*)/GGC No. 1.

d. Procedure at Completion of Test.

- (1) Remove all patches from the patching panel except the permanent connections under the hinged cover (par. 34).
- (2) Remove all field wire connections from the binding posts on the SIGNAL BINDING POSTS box.

37. Secure Teletypewriter Operation, Testing Procedures

Note. Perform the nonsecure teletypewriter operation testing procedure (par. 36) before testing the secure teletypewriter operation.

a. Test Setup.

- (1) Check to be sure that all permanent patches between the TH-5/TG's, TT-76(*)/GGC's, TT-4(*)/TG, and patching panel (par. 34) have been properly connected.
- (2) On TH-5/TG No. 1 and TH-5/TG No. 2, operate the 4W-2W-TEL switch to the 2W position.
- (3) On the line unit of each TH-5/TG, operate the 4W FULL DUPLEX-NORMAL switch to the NORMAL position and the 2W SPEECH PLUS 4W-NORMAL 2W-4W switch to the NORMAL 2W position.
- (4) Make the following connections from the equipment to the patching panel:

Equipment		Patching panel jack
Type No.	Jack	
TH-5/TG NO. 1	LOOP SEND	CIPHER 1 TH-5 LOOP SEND
TH-5/TG NO. 1	LOOP REC	CIPHER 1 TH-5 LOOP REC
TH-5/TG NO. 2	LOOP SEND	CIPHER 2 TH-5 LOOP SEND
TH-5/TG NO. 2	LOOP REC	CIPHER 2 TH-5 LOOP REC

- (5) Make the following patches between the jacks on the patching panel:

Patching panel	
From jack	To jack
TT-4 REC	CIPHER 2 PRINTER
TT-4 SEND	CIPHER 2 KBD SIG
TH-5 LINE 1 4WS 2W	TH-5 LINE 2 4WS 2W
TT-76 NO. 1 REC	CIPHER 1 PRINTER
TT-76 NO. 1 SEND	CIPHER 1 KBD SIG
TT-76 NO. 1 TD	CIPHER 1 TD SIG

b. *Testing Communication Security Equipment.* Perform half-duplex testing in plain and cipher modes of operation as follows:

Note. Local full-duplex testing is not required to test TSEC/KW-9 because half-duplex testing operates the equipment to its full capacity.

(1) *Plain Operation.*

- Place the P-C switch on the TSEC/KW-9 No. 1 in the P position.
- Install tape in the TT-76(*)/GGC No. 1 transmitter-distributor (TM 11-2225).

- Move the STOP-START-FEED-RETRACT switch on transmitter-distributor to the START position.
- Check to see that TT-76(*)/GGC No. 1 transmitter-distributor will *not* transmit tape.
- Depress CIPHER No. 1 text switch. Tape should now transmit.

(2) *Cipher Operation.*

- Place the P-C switch on TSEC/KW-9 No. 1 in the C position and check to see that tape is transmitted.
- Remove the patch cord from the CIPHER 1 TD SIG jack on the patching panel and insert it into the CIPHER 2 TD SIG jack.
- Repeat (1) through (6) above; use TSEC/KW-9 No. 2, TT-76(*)/GGC No. 2, and CIPHER No. 2 test switch.

c. *Procedure for Completing Test.* Remove all patches from the patching panel except the permanent connections under the hinged cover (par. 34).

Section II. PREOPERATIONAL PROCEDURES

38. Siting

a. The location of the AN/MGC-17 will depend upon its use in the division area type communications system. The considerations affecting the siting of the AN/MGC-17 and the factors governing the distance of the AN/MGC-17 to the other shelters in the system are covered in TM 11-5805-204-15.

b. When the shelter is placed on the ground, it should be located on firm, dry ground with good drainage. The site should be prepared and leveled, and if possible, the shelter should be placed on concrete blocks or wooden beams.

c. Place the generator set approximately 75 feet from the shelter.

39. Installation of Shelter

Note. To install the shelter on the ground or on a truck, four men and a crane, winch, or helicopter capable of lifting 2,000 pounds are required.

a. *Loading Shelter* (fig. 18). If the shelter is to be loaded on a truck, proceed as follows:

- Use the sling hooks nearest the turnbuckles and hook the four sling assemblies to the shelter lifting eyes.

- Lay the sling assemblies on top of the shelter.
- Hook the four sling hooks in the lifting ring.
- Slip the lifting ring over the hook of the lifting device.

Warning: To avoid injury to personnel and damage to equipment, only the personnel engaged in the actual loading operation should be permitted near the truck, lifting device, and shelter. To eliminate confusion, all instructions must come from the loading crew supervisor.

- Tie a 1/2-inch guide rope (at least 15 feet long) to each of the rear towing eyes.
- Check to see that all tools and equipment are removed from the truck body and lower the tailgate.
- Slowly lift the shelter from the ground to a position high enough to clear the truck body.

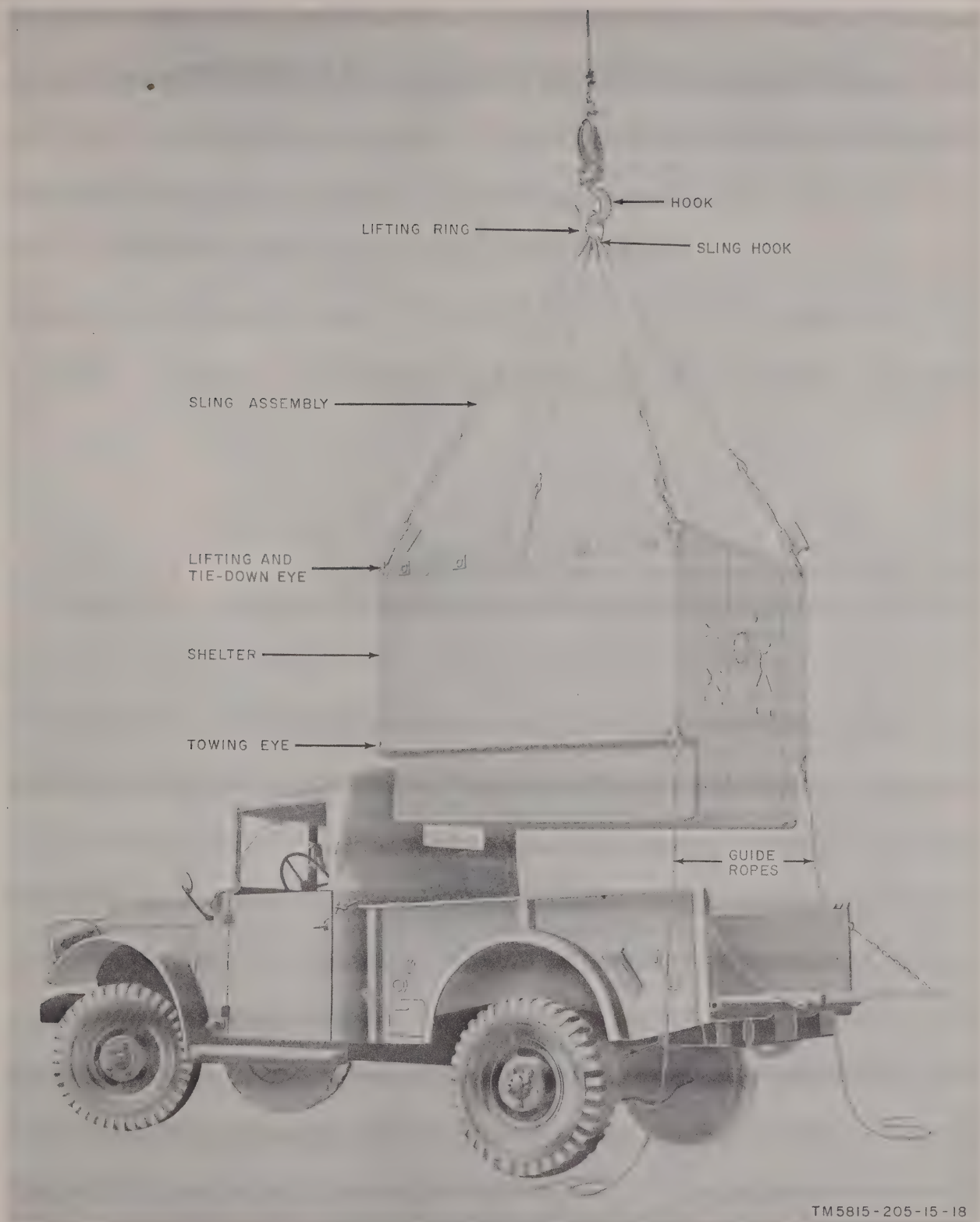


Figure 18: Loading shelter.

- (8) Back the truck into position under the shelter.

Warning: All personnel must remain clear of the truck while the shelter is being lowered into position.

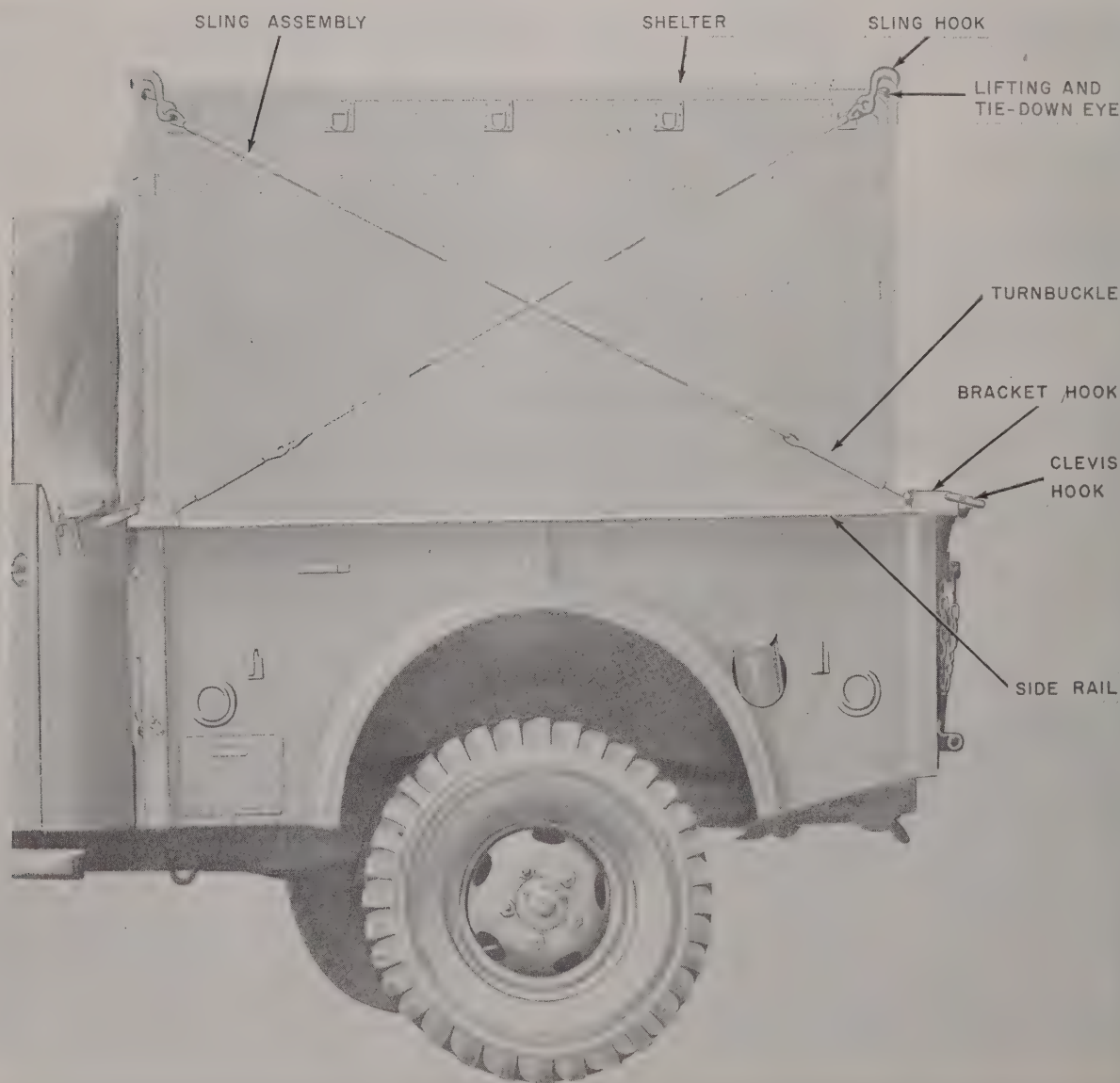
- (9) Position a man at each of the guide ropes to hold the shelter in position. Slowly lower the shelter into the truck body.

Note. The door of the shelter must be at the rear of the truck and the front of the shelter must be abutted against the front of the truck body.

- (10) Remove the lifting ring from the lifting hook and disassemble the lifting ring and sling hooks.
(11) Remove the four sling hooks from the shelter lifting eyes.
(12) Remove the guide ropes.

b. Securing Shelter to Truck (fig. 19).

- (1) Use the sling hooks at the end farthest from the turnbuckles and hook each of the four sling assemblies to a tiedown eye of the shelter.
(2) Use the sling assembly which is attached to the tiedown eye at the front



TM 5815-205-15-19

Figure 19. Shelter mounted on truck.

of the shelter and place the sling hook nearest the turnbuckle under the side rail and behind the cargo rack support second from the rear.

- (3) Use the sling assembly which is attached to the tiedown eye at the rear of the shelter and place the sling hook nearest the turnbuckle under the side rail and in front of the cargo rack support second from the front.
- (4) Repeat the procedures in (1) through (3) above to secure the other side of the shelter.

Caution: Do not overtighten the turnbuckles. To prevent twisting the

shelter in the truck body, tighten all of the turnbuckles at the same time.

c. Unloading. To unload the shelter from the truck, reverse the procedures given in *a* and *b* above, and mount the shelter on the ground (par. 38).

40. Controls and Instruments

This paragraph describes, locates, illustrates, and gives the function of the controls and instruments used in Teletypewriter Central Office AN/MGC-17. The controls and instruments for the organizational equipment are covered in their respective technical manuals (app. I).

a. POWER DISTRIBUTION PANEL (fig. 13).

Control or instrument	Function and description
MAIN circuit breaker (2 ganged circuit breakers 8A and 8B).	Rating: 50 amperes, two-position ON-OFF switch. Provides overload protection for incoming 115-volt ac power supply. Controls ac power supply to the other circuit breakers.
Circuit breakers:	Rating: 15 amperes, two-position ON-OFF switches.
1—LIGHTS	Provides overload protection to all lighting devices.
2—OPR POS	Provides overload protection to the organizational equipment.
3—BLOWER 1	Provides overload protection to blower No. 1.
4—BLOWER 2	Provides overload protection to blower No. 2.
5—CONVENIENCE RECEPTACLE.	Provides overload protection to convenience receptacle.
6—HEATER	Provides overload protection to HEATER receptacle.
7—OVERLOAD	Rating: 22 amperes, two-position ON-OFF switch, protecting the power unit from being overloaded.
VOLTAGE meter (voltmeter (0-150 scale)).	Indicates ac voltage input to shelter.
CURRENT meter (ammeter (0-50 scale)).	Indicates amount of alternating current used by shelter equipment.

b. Miscellaneous Switches.

Control or instrument	Function and description						
NEON switch (fig. 9)	Two-position ON-OFF switch. Controls neon lamp.						
NORMAL-BLACKOUT switch (fig. 9).	Two-position ON-OFF switch. Controls all lighting in shelter except the neon lamp.						
	<table> <tr> <th>SW pos</th><th>Function</th></tr> <tr> <td>NORMAL</td><td>Permits lights to be controlled by their individual switches.</td></tr> <tr> <td>BLACKOUT</td><td>Permits door microswitch to control all lights except the neon lamp.</td></tr> </table>	SW pos	Function	NORMAL	Permits lights to be controlled by their individual switches.	BLACKOUT	Permits door microswitch to control all lights except the neon lamp.
SW pos	Function						
NORMAL	Permits lights to be controlled by their individual switches.						
BLACKOUT	Permits door microswitch to control all lights except the neon lamp.						
Door microswitch (fig. 9)	Controls all lighting, except neon lamp, when NORMAL-BLACKOUT switch is on BLACKOUT. When the door is closed the lights go on.						
FLUORESCENTS switch (fig. 9)	Two position ON-OFF switch. Controls all fluorescent lights.						
TA-182/U No. 1 through No. 6 switches on the front wall (fig. 8).	Two position ON-OFF switches. Controls ac power to VF ringers No. 1 through No. 6.						
TH-5/TG No. 1 through No. 3 switches on the left wall (fig. 6).	Two position ON-OFF switch. Controls ac power to TH-5/TG's No. 1 through No. 3.						
NIGHT ALARM switch (fig. 6)	Two position ON-OFF switch. Controls NIGHT ALARM buzzer.						

c. *Electrical Space Heater HD-375/U.*

Control or instrument	Function and description								
OFF-HEAT-FAN ONLY switch	Three-position switch. <table> <tr> <th>SW pos</th><th>Function</th></tr> <tr> <td>OFF</td><td>Cuts off ac power to heater.</td></tr> <tr> <td>HEAT</td><td>Applies ac power to the heater element and fan motor.</td></tr> <tr> <td>FAN ONLY</td><td>Applies ac power to the fan motor only.</td></tr> </table>	SW pos	Function	OFF	Cuts off ac power to heater.	HEAT	Applies ac power to the heater element and fan motor.	FAN ONLY	Applies ac power to the fan motor only.
SW pos	Function								
OFF	Cuts off ac power to heater.								
HEAT	Applies ac power to the heater element and fan motor.								
FAN ONLY	Applies ac power to the fan motor only.								
OFF-HI-MED-LO switch	Four-position switch. Controls amount of heat from heater.								
RESET circuit breaker	Rating: 15 amperes. Overload and overheat protection to heater.								

d. *Switch Box SA-331/U.*

Control or instrument	Function						
POWER SUPPLY switch	Two-position switch. Permits transfer of power from one power source to another. <table> <tr> <th>SW pos</th><th>Function</th></tr> <tr> <td>NO 1</td><td>Connects the OUTPUT receptacle to the INPUT NO. 1 receptacle on the switch box.</td></tr> <tr> <td>NO 2</td><td>Connects the OUTPUT receptacle to the INPUT NO. 2 receptacle on the switch box.</td></tr> </table>	SW pos	Function	NO 1	Connects the OUTPUT receptacle to the INPUT NO. 1 receptacle on the switch box.	NO 2	Connects the OUTPUT receptacle to the INPUT NO. 2 receptacle on the switch box.
SW pos	Function						
NO 1	Connects the OUTPUT receptacle to the INPUT NO. 1 receptacle on the switch box.						
NO 2	Connects the OUTPUT receptacle to the INPUT NO. 2 receptacle on the switch box.						

41. Grounding

To reduce the hazard of electrical shock, Teletypewriter Central Office AN/MGC-17 must be properly grounded before connecting the shelter to the power source. Select a site for the ground rod so it will not interfere with the entrance to the shelter; field wires, or power and signal cables. Ground both the shelter and the generator set as follows:

a. *Shelter.*

- (1) Loosen the fasteners and lift the cover of the SIGNAL & POWER ENTRANCE box (fig. 12). Straighten the stays to hold the cover up.
- (2) Fold the side flaps out from under the cover and hook them onto the retaining studs at each side of the SIGNAL & POWER ENTRANCE box.
- (3) Remove the switchbox (fig. 6), the ground rod (fig. 7), and the sledge hammer (fig. 8) from their mountings.
- (4) Install the ground rod as follows:
 - (a) Select the lowest, dampest site within 10 feet of the shelter, preferably in clay or loamy soil.
 - (b) Scoop out a small hole about 6 inches deep in the selected location.

- (c) Remove any paint or grease from the ground rod.
- (d) Drive the ground rod into the hole until the top is approximately 3 inches above the bottom of the hole.
- (e) Saturate the ground around the rod with water. Keep the ground around the rod moist.
- (5) Remove the ground lead from the ACCESSORIES & SPARES cabinet.
- (6) Connect one end of the ground lead to the ground rod and the other end to the GRD lug (fig. 12) in the SIGNAL & POWER ENTRANCE box.

b. *Generator Set.*

- (1) Remove the ground rod from its mounting.
- (2) Install the ground rod (a (4) above).
- (3) Mount the switchbox on the trailer (fig. 1).
- (4) Remove the ground lead from the ACCESSORIES box in the generator set.
- (5) Connect one end of the ground lead to the ground rod and the other end to the GND lug on the switchbox.

42. Power Connections

Before making any power connections, see

that all circuit breakers and switches are in their OFF positions (figs. 9 and 13).

Warning: Both the shelter and the generator set must be grounded (par. 41) before power is connected.

a. Generator Set. When the generator set is used to supply power, proceed as follows:

- (1) Remove the power cable and power studs from their cable reels (fig. 10).
- (2) Connect the red and white leads of one power stud to the neutral terminal and the black lead to the positive terminal of the filter box of one generator set.
- (3) Remove the cover from the connector of the power stud ((2) above) and connect the power stud to the INPUT No. 1 receptacle on the switchbox.
- (4) Connect the red and white leads of the other power stub to the neutral terminal and the black lead to the positive terminal of the filter box of the other generator set.
- (5) Remove the cover from the connector of the power stub ((4) above) and connect the power stub to INPUT No. 2 receptacle on the switchbox.
- (6) Remove the covers from both connectors of the power cable and connect the female connector to the POWER IN receptacle in the SIGNAL & POWER ENTRANCE box (fig. 12) and the other connector to the OUTPUT receptacle on the switchbox.

b. Commercial Power Source. When a commercial power source is used, proceed as follows:

- (1) Disconnect the power from the commercial power source terminals.
- (2) Remove the power cable and one power stub from their reel (fig. 10).
- (3) If the power supply is 50-60 cps, 115 volts, single-phase, or 115/230 volts, three-wire single-phase, connect the red and white leads of the power stub to the neutral terminal and the black lead to one of the other terminals.
- (4) If the power supply is 50-60 cps, 120/208 volts, four-wire, three-phase grounded neutral distribution system, connect the red and white leads to the neutral wire and the black lead to

either phase 1, phase 2, or phase 3 terminal.

- (5) Remove the covers from the connector of the power stub and junction box (fig. 9) and connect the power stub to the male side of the junction box.
- (6) Remove the cover from the male connector of the power cable and connect it to the other receptacle of the junction box.
- (7) Remove the covers from the female connector of the power cable and the POWER IN receptacle in the SIGNAL & POWER ENTRANCE box and interconnect the connector and receptacle.

43. Energizing Ac Circuits

a. When the generator set is used to supply the power, start the power unit (TM 11-900A).

b. When a commercial power source is used, restore power to the source terminals.

c. Operate the MAIN circuit breaker to the ON position (fig. 13).

d. Check the voltmeter. It should indicate 115 volts ac.

e. Check the ammeter. It should indicate zero.

f. Operate the LIGHTS circuit breaker to the ON position.

g. Operate the NEON and FLUORESCENTS switches (fig. 9) to their ON positions.

h. Operate the NORMAL-BLACKOUT switch to the NORMAL position. When blackout conditions are required, operate the switch to the BLACKOUT position.

Caution: Open the blower vents and the air filter cover on the outside of the shelter before operating the blowers.

i. Operate BLOWER 1 and BLOWER 2 circuit breakers to their ON positions. Check to see that the blowers are operating. Operate BLOWER 1 or BLOWER 2 circuit breaker to the OFF position. One of the blowers is used as a spare.

j. Operate the HEATER circuit breaker to the ON position as required.

k. Operate the heater OFF-HEAT-FAN ONLY switch to the position required.

l. Check the ammeter. It should indicate less than 16 amperes.

Section III. SIGNAL CONNECTIONS

44. Circuit Planning

The AN/MGC-17 is normally connected to the SB-611/MRC through a 26-pair cable. In the AN/MGC-17, 19 pair are connected in parallel with binding posts in the SIGNAL BINDING POSTS box and terminated inside the shelter; seven pairs are unterminated spares. One pair, terminated in the JACK & BINDING POSTS panel, is used for intershelter communications; 12 pairs, terminated in the SB-22/PT, are used for switching of local or trunk circuits; 6 pair, terminated in the patching panel, are used for the three teletypewriter equipments (3 full-duplex or 3 half-duplex circuits). When the 26-pair receptacle is used to connect a cable to the SB-611/MRC, the corresponding binding posts are not available for local circuits unless dummy plugs are inserted in the patching panel of the SB-611/MRC.

a. Local Circuits on Field Wire. Local circuits are connected to binding posts in the SIGNAL BINDING POSTS box or to a dropline box.

(1) *SIGNAL BINDING POSTS box.* Local circuits are connected through the SIGNAL BINDING POSTS box by connecting field wire to a pair of binding posts (par. 46).

(2) *Dropline box.* Local circuits are connected through a dropline box by connecting a 26-pair cable between one of the 26-pair receptacles on the dropline box and the 26-pair receptacle in the SIGNAL & POWER ENTRANCE box (par. 45). Field wire is then connected to a pair of binding posts on the dropline box (par. 46).

b. Local or Trunk Circuits on Cable. Local and trunk circuits are established directly, or through a dropline box, to the SB-611/MRC. A 26-pair cable is connected between SIGNAL 1 receptacle of the AN/MGC-17 and a SIG IN or SIG OUT receptacle of the SB-611/MRC. These circuits appear in the AN/MGC-17 on lines 1 through 12 of the switchboard and lines 13 through 18 of the patching panel.

c. Special Circuits. An intershelter local battery telephone circuit is established on pair No. 26 when a 26-pair cable is connected between SIGNAL 1 receptacle of the AN/MGC-17 and

SIG IN or SIG OUT receptacle of the SB-611/MRC. When SIGNAL 1 receptacle is not used, the circuits are established by connecting field wire between the LB PHONE binding posts in the SIGNAL BINDING POSTS box of the AN/MGC-17 and the corresponding pair of binding posts in another shelter. The A and B binding posts in the SIGNAL BINDING POSTS box and on the JACK & BINDING POST panel provide entry into the shelter for two pairs. These binding posts are used to interconnect additional telephone sets or other equipment inside and outside the shelter.

45. Cable Connections, 26-pair

Connections of 26-pair cables to either the SIGNAL & POWER ENTRANCE box or to a dropline box are made in the same way. To connect a 26-pair cable, proceed as follows:

a. Remove a 26-pair cable from its reel (fig. 10).

b. Remove the protective cover from the 26-pair receptacle in the SIGNAL & POWER ENTRANCE box or from the dropline box and from the 26-pair connector as follows:

- (1) Turn the locking ring counterclockwise until the orange mark on the sleeve is in line with the OPEN mark on the cover.
- (2) Disengage the slot on the cover from the cam on the connector.
- (3) Lift the cover off the connector.

c. Connect the 26-pair connector of the 26-pair cable to the 26-pair receptacle as follows:

- (1) Place the connector on the receptacle so that the male and female portions of the connector mate with those of the receptacle and press them firmly together.
- (2) Turn the locking ring of the receptacle counterclockwise until the orange mark is in line with the CLOSED mark on the receptacle.
- (3) Turn the locking ring of the connector clockwise until the orange mark is in line with the CLOSED mark on the connector.

46. Field Wire Connections

To make field wire connections to the binding posts in the SIGNAL BINDING POSTS box or the dropline box, proceed as follows:

a. SIGNAL BINDING POSTS Box.

- (1) Loosen the wing fasteners and lift the cover of the SIGNAL BINDING POSTS box.
- (2) For switchboard connections to local circuits, connect field wire to the binding posts (pairs 1-12) as required (par. 10). Record the connections made.
- (3) For teletypewriter line connections to local circuits, connect field wire to the binding posts (pairs 13-18). Record the connections made.
- (4) To connect to the telephone set, use

the LB PHONE binding posts, if the SIGNAL 1 receptacle is not being used.

- (5) When the A or B binding posts in the SIGNAL BINDING POSTS box (fig. 11) are used, connect field wire between the binding posts of the telephone set or other equipment and the A and B binding posts on the JACK & BINDING POST panel.
- (6) When all connections have been made in the SIGNAL BINDING POSTS box, pull out the cover flaps, lower the cover, and fasten the flaps. A slot in each flap engages a stud on the side of the box.

b. Dropline Box.

- (1) Loosen the snapslide fastener and lift the cover.
- (2) Connect field wire through the side slots to the binding posts as required.

Section IV. OPERATION

47. Types of Operation

The teletypewriter equipments, Communication Security Equipments, and associated VF equipment may be arranged to operate half-duplex or full-duplex, by making patched connections at the patching panel. They may be connected to local circuits or to an SB-611/MRC. Telephone TA-312/PT provides communication between the AN/MGC-17 and the SB-611/MRC. The operating procedures for all organizational equipment are described in the appropriate manual (app. I).

48. Operating Procedures

a. Determine the facilities required and make the necessary connections (pars. 44-46).

b. Operate the TH-5/TG switches, located on the left wall (fig. 6), to the ON position as required.

c. Operate the switches on each TH-5/TG (TM 11-2239) for the desired type of operation as indicated in the chart below:

Type of operation	NORM-REC-SEND switch position	4W-2W-TEL switch position
Half-duplex (two-wire)	NORM	2W
Half-duplex (four-wire)	NORM	4W
Full-duplex	NORM	4W

d. Operate the switches on the line unit on each TH-5/TG for the desired type of operation as indicated in the chart below:

Type of operation	4W FULL DUPLEX-NORMAL switch position	2W SPEECH PLUS 4W-NORMAL 2W-4W switch position
Half-duplex (two wire).	NORMAL	NORMAL 2W
Half-duplex (four-wire).	NORMAL	4W
Full-duplex	4W FULL DUPLEX	4W

e. Operate the TA-182/U switches, located on the front wall (fig. 8), to ON as required.

f. Operate the switch on each TA-182/U (TM 11-2137) for the desired type of operation as indicated in the chart below:

Type of operation	TP-TG switch position	2W-4W switch position
Half-duplex (two-wire)	TG	2W
Half-duplex (four-wire)	TG	4W
Full-duplex	TG	4W

g. Perform the preliminary starting procedures for the organizational equipment as described in the applicable technical manual.

h. Make the appropriate patched connections (pars. 49 and 50) for the desired type of teletypewriter operation.

49. Nonsecure Teletypewriter Operation, Patching

Various operating combinations, using the TT-4(*)/TG or the TT-76(*)/GGC, can be obtained by making patched connections between jacks on the patching panel (fig. 14) and to jacks on the equipment. The TT-4(*)/TG is used primarily with the SB-22/PT; when not in use, the TT-4(*)/TG may be used for other types of operation. Subparagraphs a through h below describe the various patched connections. Determine the facilities required and make the necessary connections.

a. *Half-Duplex (Two-Wire or Four-Wire) and Full-Duplex Operation, Using TT-4(*)/TG* (A, fig. 20).

Patching panel jack	Equipment	
	Type No.	Jack
TT-4 REC	TH-5/TG NO. 3	LOOP REC
TT-4 SEND	TH-5/TG NO. 3	LOOP SEND

Note. TH-5/TG NO. 3 is connected through normal-through jacks to lines 17 and 18.

b. *Half-Duplex (Two-Wire or Four-Wire) and Full-Duplex Operation, Using TT-76(*)/GGC* (B, fig. 20). TT-76(*)/GGC No. 1 or TT-76(*)/GGC No. 2 may be used.

Patching panel jack	Equipment	
	Type No.	Jack
TT-76 NO. 1 SEND.	TH-5/TG NO. 1	LOOP SEND
TT-76 NO. 1 TD.	TH-5/TG NO. 1	LOOP SEND
TT-76 NO. 1 REC.	TH-5/TG NO. 1	LOOP REC

Note. TH-5/TG NO. 1 is connected through normal-through jacks to lines 13 and 14.

c. *Half-Duplex (Two-Wire or Four-Wire) and Full-Duplex Operation, Using TT-4(*)/TG and TT-76(*)/GGC* (C, fig. 20).

(1) TT-4(*)/TG.

Patching panel jack	Equipment	
	Type No.	Jack
TT-4 REC	TH-5/TG NO. 3	LOOP REC
TT-4 SEND	TH-5/TG NO. 3	LOOP SEND

Note. TH-5/TG NO. 3 is connected through normal-through jacks to lines 17 and 18.

(2) TT-76(*)/GGC TT-76(*)/GGC No. 1 or TT-76(*)/GGC No. 2 may be used.

Patching panel	
From jack	To jack
TT-4 SEND	TT-76 TD
TT-4 REC SERIES	TT-76 REC

d. *Half-Duplex (Two-Wire) Operation, Using TT-4(*)/TG, TH-5/TG, and TA-182/U* (D, fig. 20).

(1) TT-4(*)/TG.

Patching panel jack	Equipment	
	Type No.	Jack
TT-4 REC	TH-5/TG NO. 3	LOOP REC
TT-4 SEND	TH-5/TG NO. 3	LOOP SEND

(2) TA-182/U.

Patching panel	
From jack	To jack
TA-182 LOOP (1, 2, 3, or 4)	TH-5 LINE 3 4WS 2W
TA-182 LINE (1, 2, 3, or 4)	LINE 17

e. *Half-Duplex (Two-Wire) Operation, Using TT-76(*)/GGC, TH-5/TG and TA-182/U* (E, fig. 20).

(1) TT-76(*)/GGC. TT-76(*)/GGC No. 1 or TT-76(*)/GGC No. 2 may be used.

Patching panel jack	Equipment	
	Type No.	Jack
TT-76 NO. 1 REC.	TH-5/TG NO. 1	LOOP REC
TT-76 NO. 1 SEND.	TH-5/TG NO. 1	LOOP SEND
TT-76 NO. 1 TD.	TH-5/TG NO. 1	LOOP SEND

(2) TA-182/U.

Patching panel	
From jack	To jack
TA-182 LOOP (1, 2, 3, or 4)	TH-5 LINE 1 4WS 2W
TA-182 LINE (1, 2, 3, or 4)	LINE 13

f. SB-22/PT, Answering Calls (F, fig. 20). To answer switchboard calls using the TT-4(*)/TG or a TT-76(*)/GGC and TH-5/TG, proceed as follows:

- (1) Make the appropriate connections for the desired type of equipment.

Patching panel jack	Equipment	
	Type No.	Jack
TT-4 REC	TG-5/TG NO. 1, NO. 2, or NO. 3	LOOP REC
or TT-76 NO. 1 or NO. 2	TH-5/TG NO. 1, NO. 2, or NO. 3	LOOP REC
TT-4 SEND	TH-5/TG NO. 1, NO. 2, or NO. 3	LOOP SEND
or TT-76 NO. 1 or NO. 2	TH-5/TG NO. 1, NO. 2, or NO. 3	LOOP SEND

- (2) On the patching panel, patch from the TH-5 LINE (1, 2, or 3) 4WS 2W jack to the SB-22 OPR TH-5 jack.
- (3) Connect the plug from line pack 17 on the switchboard into the calling party's jack. Answer with the TT-4(*)/TG or TT-76(*)/GGC and determine the destination of the call.
- (4) If the calling party wishes to be switched to another line on the switchboard, remove the line 17 plug from

the calling line, insert it in the jack of the line to be called, and ring with the TH-5/TG. The drop of line 17 will operate and the alarm will sound.

- (5) Insert the plug from the line pack of the called line into the jack on the calling line. Check the transmission.
- (6) Remove the operator's plug from the called line and insert it in the jack of line 17. This will restore the drop and the alarm will stop.

g. Tape Perforation on TT-76()/GGC from TT-4(*)/TG Keyboard (G, fig. 20).*

- (1) Operate the selector switch on the TT-76(*)/GGC to the 3 LOCAL RE-PUNCH position.
- (2) On the patching panel, patch from the TT-4 SEND jack to the TT-76 (No. 1 or No. 2) LOCAL jack.

h. Page Printing on TT-4()/TG from TT-76(*)/GGC Transmitter-Distributor (H, fig. 20).*

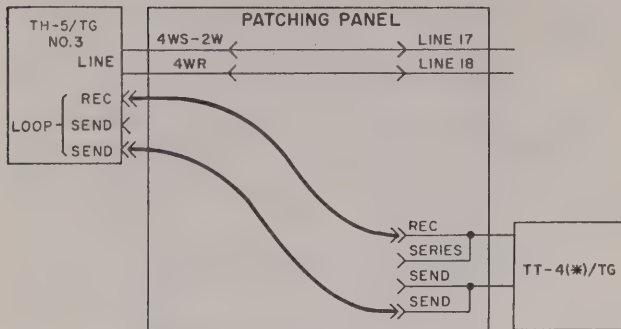
- (1) Operate the selector switch on the TT-76(*)/GGC to the 3 LOCAL RE-PUNCH position.
- (2) On the patching panel, patch from the TT-4 REC jack to the TT-76 (NO. 1 or NO. 2) LOCAL jack.

i. Series Jacks, DC Operation (fig. 26). Use the series jacks in the patching panel to reverse the polarity in the dc source or to connect equipment in series as follows:

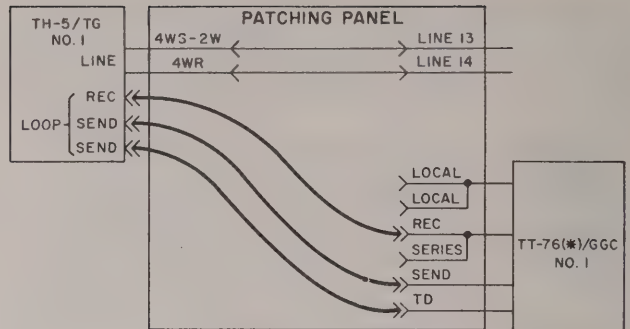
- (1) Insert the plug from the equipment supplying the battery for the loop into SERIES REV NO. 1 jack. SERIES NO. 2 jack reverses the polarity on SERIES NO. 3 jack and provides the same polarity on SERIES REV NO. 1 jack.

Note. SERIES NO. 3 jack may be used in place of SERIES NO. 2 jack. SERIES NO. 3 jack reverses the polarity on SERIES NO. 2 jack and provides the same polarity on SERIES REV NO. 1 jack.

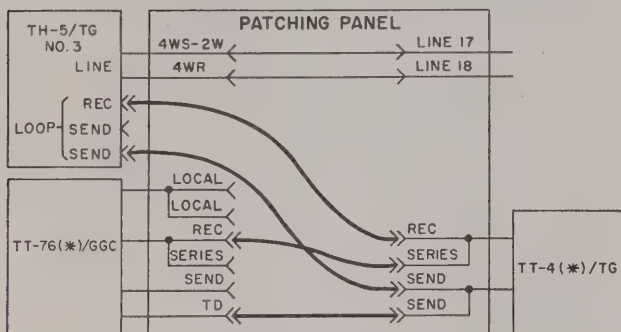
- (2) Insert the plug from the equipment supplying the battery for the dc loop into SERIES REV NO. 1 jack. Equipments connected to SERIES NO. 2 and SERIES NO. 3 jacks will have the same polarity.



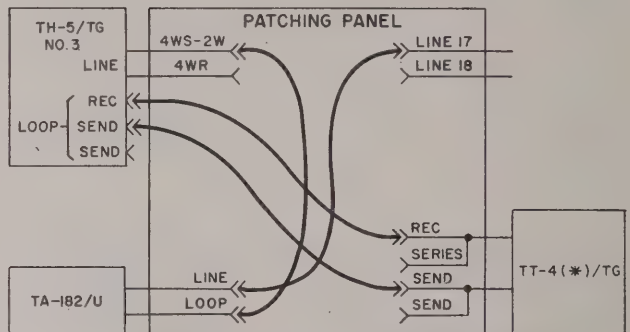
A 2-WIRE OR 4-WIRE HALF-DUPLEX, AND FULL-DUPLEX OPERATION USING TT-4(*)/TG



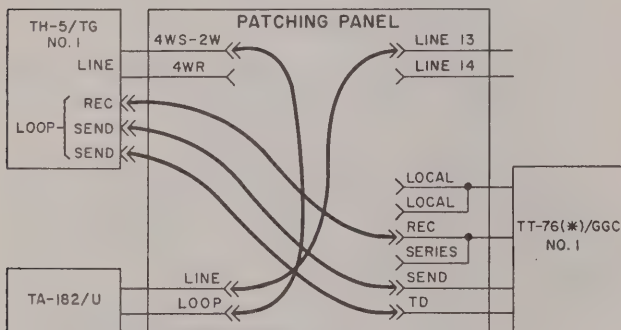
B 2-WIRE OR 4-WIRE HALF-DUPLEX, AND FULL-DUPLEX OPERATION USING TT-76(*)/GGC



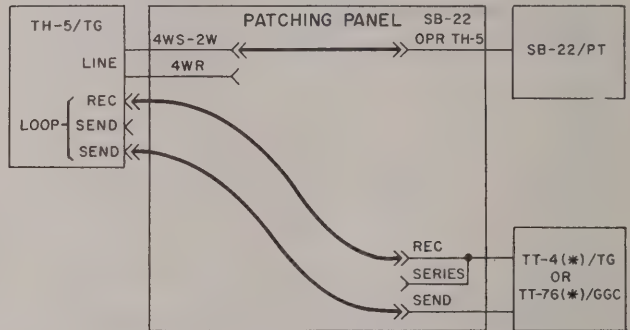
C 2-WIRE OR 4-WIRE HALF-DUPLEX, AND FULL-DUPLEX OPERATION USING TT-4(*)/TG AND TT-76(*)/GGC



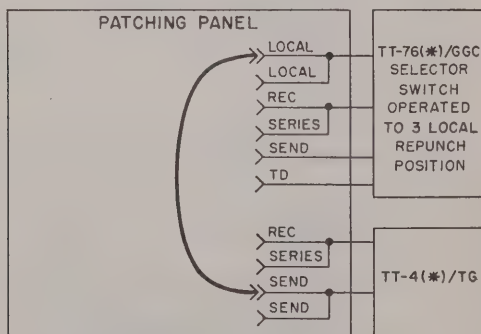
D 2-WIRE HALF-DUPLEX OPERATION USING TT-4(*)/TG TH-5/TG AND TA-182/U



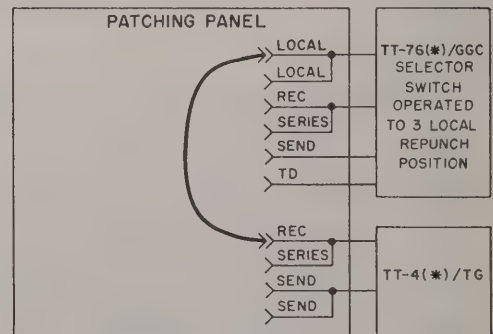
E 2-WIRE HALF DUPLEX OPERATION USING TT-76(*)/GGC, TH-5/TG AND TA-182/U



F ANSWERING SB-22/PT CALLS USING TT-4(*)/TG OR TT-76(*)/GGC AND TH-5/TG



G TAPE PERFORATION ON TT-76(*)/GGC FROM TT-4(*)/TG KEYBOARD



H PAGE PRINTING ON TT-4(*)/TG FROM TT-76(*)/GGC TRANSMITTER-DISTRIBUTOR

TM5815-205-15-20

Figure 20. Patching for teletypewriter operation (nonsecure).

50. Secure Teletypewriter Operation, Patching

When operating Communication Security Equipment, full-duplex (four-wire) or half-duplex (two-wire or four-wire), various operating combinations can be obtained by making patched connections between jacks on the patching panel and jacks on the equipment. The various patches are described in *a* and *b* below. Determine the facilities required and make the necessary connections.

a. Half-Duplex (Two-Wire or Four-Wire) Operation, Using TSEC/KW-9 (fig. 21). To interconnect the TT-4(*)/TG keyboard, the TT-76(*)/GGC NO. 1 transmitter-distributor, the TT-76(*)/GGC NO. 1 reperforator, and the TT-4(*)/TG page printer, proceed as follows:

- (1) Make the following connections between the equipment and the patching panel:

Patching panel jack	Equipment	
	Type No.	Jack
CIPHER 1 TH-5 LOOP SEND.	TH-5/TG NO. 1	LOOP SEND
TT-76 NO. 1 REC.	TH-5/TG NO. 1	LOOP REC

Note. TH-5/TG NO. 1 is connected through normal-through jacks to lines 13 and 14 (fig. 26).

- (2) Make the following patches at the patching panel:

Patching panel	
From jack	To jack
TT-4 SEND	CIPHER 1 KBD SIG
TT-4 REC	CIPHER 1 PRINTER
TT-76 NO. 1 REC SERIES.	CIPHER 1 TH-5 LOOP REC.
TT-76 NO. 1 TD	CIPHER 1 TD SIG

- (3) To add TT-76(*)/GGC keyboard to the circuit, patch from the TT-76 NO. 1 SEND jack to the TT-4 SEND jack on the patching panel.
- (4) To add TT-76(*)/GGC NO. 2 reperforator to the circuit, patch from the TT-76 NO. 2 REC jack to TT-4 REC SERIES jack on the patching panel.

- (5) To transmit clear text from either transmitter-distributor, operate the associated CIPHER (1 or 2) TEXT switch.

b. Full-Duplex Operation, Using TSEC/KW-9 or SSM-33 (fig. 22). This method of operation uses two Telegraph Terminals TH-5/TG arranged for two-wire operation, one for transmitting and one for receiving. The send circuit includes the TT-4(*)/TG keyboard, Communication Security Equipment (cipher 1), the transmitter-distributor of TT-76(*)/GGC NO. 1, TH-5/TG NO. 1, the reperforator of TT-76(*)/GGC NO. 1 and line 13. The receiving circuit includes line 14, TH-5/TG NO. 2, Communication Security Equipment (cipher 2), the page printer of the TT-4(*)/TG, and the reperforator of TT-76(*)/GGC NO. 2.

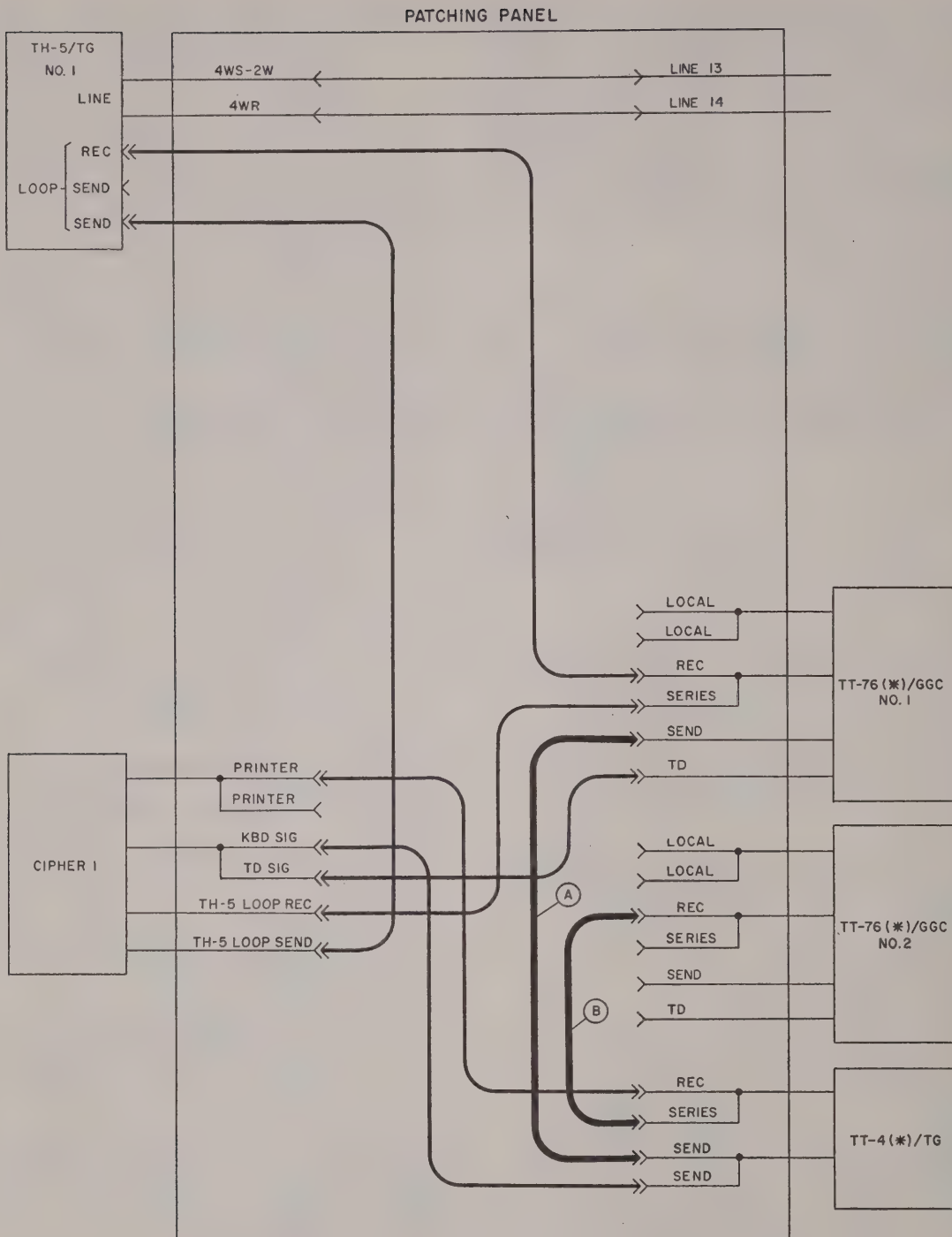
- (1) Make the following connections between the equipment and the patching panel:

Patching panel jack	Equipment	
	Type No.	Jack
CIPHER 1 TH-5 LOOP SEND.	TH-5/TG NO. 1	LOOP SEND
TT-76 NO. 1 REC.	TH-5/TG NO. 1	LOOP REC
CIPHER 2 TH-5 LOOP REC.	TH-5/TG NO. 2	LOOP REC

- (2) Make the following patches on the patching panel:

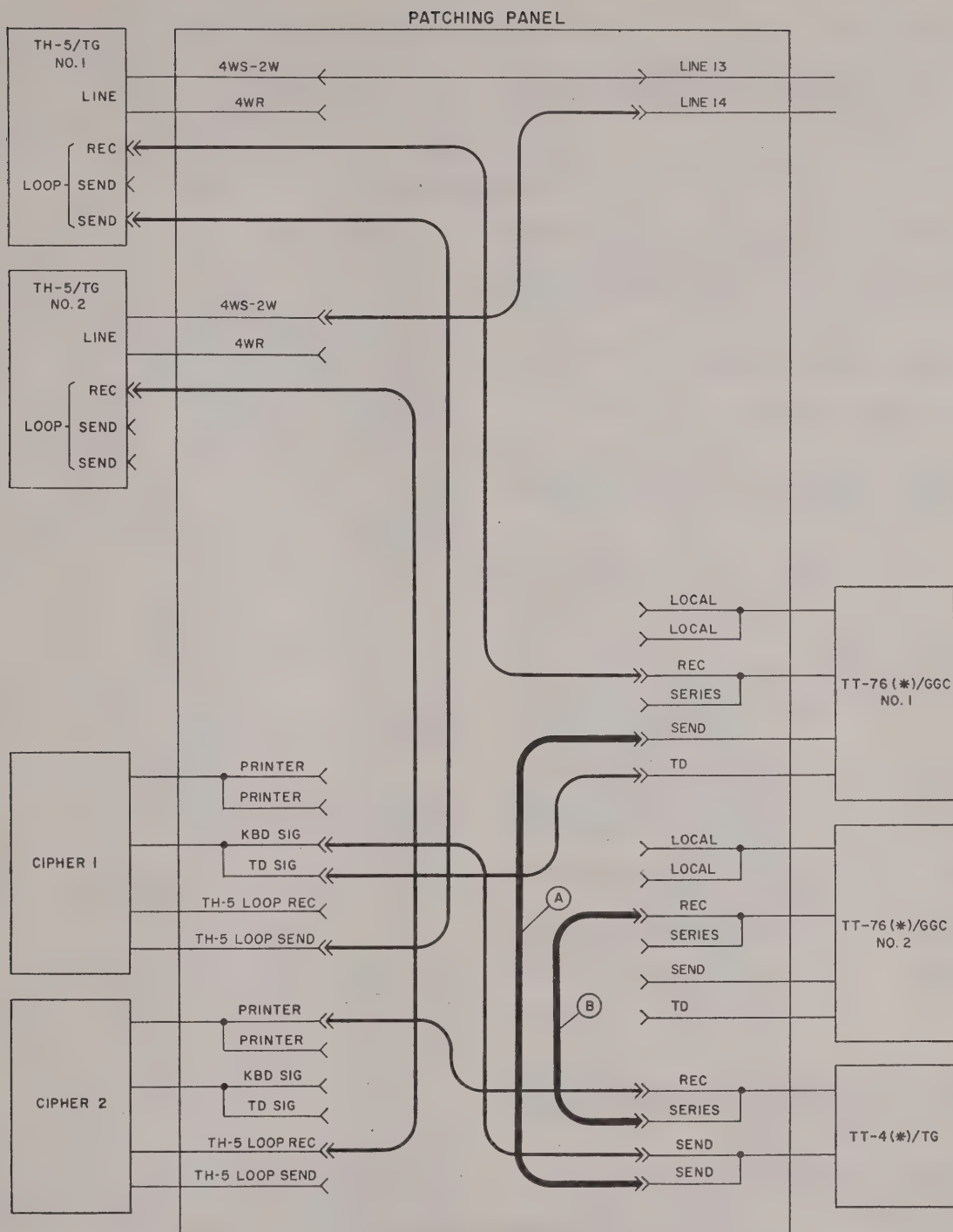
Patching panel	
From jack	To jack
TT-4 SEND	CIPHER 1 KBD SIG
TT-4 REC	CIPHER 2 PRINTER
LINE 14	TH-5 LINE 2 4WS 2W
TT-76 NO. 1 TD	CIPHER 1 TD SIG

- (3) To add TT-76(*)/GGC keyboard to the circuit, patch from the TT-76 NO. 1 SEND jack to the TT-4 SEND jack on the patching panel.
- (4) To add TT-76(*)/GGC reperforator to the circuit, patch from the TT-76 NO. 2 REC jack to the TT-4 REC SERIES jack on the patching panel.



TM5815-205-15-21

Figure 21. Half-duplex (two-wire or four-wire) operation, using TSEC/KW-9.



TM5815-205-15-22

Figure 22. Full-duplex operation, using TSEC/KW-9 or SSM-33.

51. Power Transfer

After one of the power units has been in operation for 4 hours or if the power unit begins to make unusual noises, follow the procedures given below:

a. Start the standby power unit (TM 11-900A).

b. When the standby power unit is running properly, operate the POWER SUPPLY switch on the switchbox to the standby power unit (No. 1 to No. 2 or No. 2 to No. 1).

c. Stop the power unit and perform the service procedures (TM 11-900A).

52. Stopping Procedures

a. *Emergency.* To turn the power off in an emergency, operate the MAIN circuit breaker to the OFF position.

b. *Normal.*

(1) Operate the following switches and circuit breakers to their OFF positions.

Circuit breaker or switch	Location
BLOWER 1 or BLOWER 2.	POWER DISTRIBUTION PANEL (fig. 13)
NEON	Ac power duct (fig. 9)
FLUORESCENTS	Ac power duct
OFF-HEAT-FAN ONLY	Heater (TM 11-5805-204-15)
OPR POS	POWER DISTRIBUTION PANEL.
HEATER	POWER DISTRIBUTION PANEL.
LIGHTS	POWER DISTRIBUTION PANEL.
OVERLOAD	POWER DISTRIBUTION PANEL.
MAIN	POWER DISTRIBUTION PANEL.

(2) Stop the power units in the generator set (TM 11-900A).

53. Operation Under Unusual Conditions

The AN/MGC-17 is designed to meet conditions of extreme cold and hot climates. The

shelter offers complete protection from the elements to personnel and equipment; however, if the SIGNAL & POWER ENTRANCE box and the SIGNAL BINDING POST box of the shelter and the power terminals of the generator set are exposed to adverse conditions, the following precautions are necessary.

a. *Cold Climates.* Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and connecting them to equipment so kinks and unnecessary loops will not result in permanent damage. Insure that binding posts, receptacles, and connectors are free of frost, snow, and ice by replacing the covers over the connectors and receptacles and closing the cover over the SIGNAL & POWER ENTRANCE and the SIGNAL BINDING POST boxes when they are not in use. Replace the connector or receptacle cover as soon as it is disconnected from the equipment; never drag or place an open connector or receptacle in the snow. Teletypewriter and Communication Security Equipment will not function effectively if temperature is below 30° F. Energize the ac circuits (par. 43), turn the HEATER switch to ON, and heat the shelter sufficiently before operating the equipment.

Warning: Be sure that the shelter is always properly ventilated.

b. *Hot Climates.* In hot, dry climates, the connectors, receptacles, and binding posts are subject to damage from dirt and dust. Cover the SIGNAL & POWER ENTRANCE and the SIGNAL BINDING POST boxes when they are not in use and replace the covers over the connectors and receptacles. Never drag or place an open connector or receptacle on the ground.

c. *Warm Damp Climates.* In warm, damp climates, the equipment is subject to damage from moisture and fungus. Wipe all moisture and fungus from the exterior of the equipment with a lint-free cloth. Follow the recommendations given in b above.

CHAPTER 3

MAINTENANCE

54. Scope of Maintenance

The operator must clean and inspect all components of Teletypewriter Central Office AN/MGC-17 regularly to keep them in good working condition. Detailed preventive maintenance procedures pertaining to the major components are described in the appropriate technical manuals or technical bulletin (app. I). The maintenance allocation chart (app. II) indicates the maintenance function to be performed at different echelons.

a. Use a clean, dry, lint-free cloth or brush for dusting.

b. For cleaning, if necessary, moisten the cloth or brush with Cleaning Compound (Federal stock No. 7930-395-9542); after cleaning, wipe dry with a cloth.

Warning: Prolonged breathing of fumes from Cleaning Compound is dangerous. Make certain that adequate ventilation is provided. Cleaning Compound is flammable; do not use it near a flame.

c. To clean the electrical contacts, use a cloth moistened in Cleaning Compound and wipe with a dry cloth.

d. Dry compressed air not exceeding 60 pounds per square inch may be used to remove dust from inaccessible places.

Warning: Compressed air is dangerous and can cause serious bodily harm. It can also cause mechanical damage to the equipment. Do not use compressed air to dry parts where Cleaning Compound or solvents have been applied.

55. Daily Preventive Maintenance

a. Check for completeness and general condition of the equipment and spare parts.

b. Remove dirt, dust, grease, and moisture from the exposed parts.

c. Remove rust, corrosion, fungus, dirt, and

moisture from binding posts, connectors, and receptacles.

d. Inspect field wire connections to the binding posts for good contact.

e. Inspect the ground rod and the connections to it.

f. Inspect all exposed cables for kinks, strains, moisture, fungus, and loose terminals and frayed, cut, or damaged insulation.

g. Tighten any loose screws.

56. Weekly Preventive Maintenance

a. Clean and tighten components, racks, mountings, installations, cables and connections.

b. Inspect components, racks, mountings, installations, and exposed metal surfaces for rust, corrosion, and moisture.

c. Inspect cables and wires for cuts, breaks, fraying, deterioration, kinks, and strain.

d. Inspect for looseness of accessible items, such as switches, circuit breakers, signal and ac power electrical assemblies, and neon lamps.

e. Inspect meters and clock for damaged glass and cases.

f. Clean air filters, nameplates, meters, and clock.

g. Wind the clock (fig. 6).

h. Inspect the shelter and generator set for support, installation, rust, corrosion, and moisture.

i. Check entrance boxes, blower exhaust, and filter intake covers for cracks, leaks, damaged gaskets, dirt, and grease.

j. Check for normal operation (par. 58).

57. Monthly Cleaning and Lubrication (2d Echelon)

a. Lubricate the locks and latches. Use Grease, graphite, aircraft (GGA) (TM 11-5805-204-15).

b. Lubricate all door hinges. Use lubricating oil, general purpose preservative (PL special),

or lubricating oil, internal combustion engine (OE-10) (TM 11-5805-204-15).

Caution: More frequent lubrication intervals may be required in excessively hot, humid, or dusty areas. Do not overlubricate.

c. Lubricate all metal-to-metal moving parts.

d. Lubricate the organizational equipment as described in applicable technical manuals (app. I).

e. Remove the air filter. Clean the filter with water. Air-dry the filter and replace it in its mounting.

58. Equipment Performance Checklist

The equipment performance checklist is used

by the operator to check the equipment performance systematically. Corrective measures that cannot be performed by the operator are performed by second echelon maintenance personnel as indicated in the check list. Use figures 25 and 26 in performing the corrective measures. When using the checklist, start at the beginning and follow each step consecutively to locate the trouble. If trouble is suspected in a particular area, start checking at that point and continue the steps in sequence. THIS CHECKLIST COVERS ONLY THE AN/MGC-17; when a fault or condition is localized to a major component, refer to the applicable technical manual (app. I). Operate the equipment as follows:

Item No.	Item	Action	Normal indications	Corrective measures
1	All switches and circuit breakers -	Operate to OFF.		
2	POWER SWITCH on switch box (generator set).	Operate to No. 1 or No. 2 as applicable.		
3	Power unit -----	Start (TM 11-900A).		
4	MAIN circuit breaker on POWER DISTRIBUTION PANEL.	Operate to ON.		
5	Voltmeter on POWER DISTRIBUTION PANEL.	Use flashlight and read-----	Voltmeter indicates 115 volts $\pm 10\%$.	Reset the MAIN circuit breaker to OFF and then to ON. Check circuit breaker CB8; replace if defective (second echelon). Check the connections of the power cable and power stub. Check the position of the switch on switch box. Change power cable or power stub (second echelon). Check to see that all other circuit breakers on the POWER DISTRIBUTION PANEL are at OFF. Check all circuit breakers; replace if defective (second echelon).
6	Ammeter on POWER DISTRIBUTION PANEL.	Use flashlight and read-----	Ammeter indicates zero-----	If one or more, but not all, of the lights fail to go on, replace the faulty light or starter. If all lamps fail to light, check wiring; check circuit breaker CB1; replace if defective (second echelon). Check switches S4, S5, and S6; replace if defective (second echelon). Check microswitch and NORMAL-BLACKOUT switch; replace if defective (second echelon). Check microswitch; replace if defective (second echelon). Check NORMAL-BLACKOUT switch; replace if defective (second echelon).
7	LIGHTS circuit breaker 1 on POWER DISTRIBUTION PANEL.	Operate to ON----- Operate NORMAL-BLACKOUT switch to NORMAL. Operate the NEON and FLUORESCENTS switches to ON.	Ammeter indicates approximately 2 amperes. Neon lamp over LIGHTS circuit breaker lights. NEON and FLUORESCENTS lights go on. Lights remain on----- Lights go out-----	
		Depress door microswitch and operate NORMAL-BLACKOUT switch to BLACKOUT. Release door microswitch-----		
		Operate NORMAL-BLACKOUT switch to NORMAL.		

Item No.	Item	Action	Normal indications	Corrective measures
8	CONVENIENCE RECEPTACLE circuit breaker 5 on POWER DISTRIBUTION PANEL.	Operate to ON. Check each convenience outlet with the extension lamp. Operate circuit breaker 5 to OFF. Operate to ON. Caution: Vent of the blower must be open. Operate BLOWER 1 circuit breaker to OFF.	Neon lamp above circuit breaker lights. Ammeter indicates approximately 2 amperes. Extension lamp lights	Replace neon lamp. Check outlet with meter; replace if defective (second echelon).
9	BLOWER 1 circuit breaker 3 on POWER DISTRIBUTION PANEL.		Neon lamp lights	Neon lamp does not light but blower operates, replace the neon lamp.
10	BLOWER 2 circuit breaker 4 on POWER DISTRIBUTION PANEL.	Repeat procedures listed for item No. 9.	Ammeter indicates approximately 4 amperes. Blower operates	Reset circuit breaker to OFF and then to ON. If ammeter reads steadily above 6 amperes, check blower motor; replace if defective (second echelon).
11	HEATER circuit breaker 6 on POWER DISTRIBUTION PANEL.	Insert heater power cord plug into its ac duct receptacle. Operate HEATER circuit breaker 6 to ON. Operate heater switch to HEAT. Operate the OFF-HI-MED-LO switch to desired position. Operate heater switch to OFF. Operate OFF-HI-MED-LO switch to OFF; operate HEATER circuit breaker 6 to OFF.	Neon lamp above HEATER circuit breaker 6 lights. Heater fan operates and heat is circulated. When room temperature rises to thermostat temperature setting, heat will cut off.	Replace faulty lamp. Press reset button on heater. Check for defective switch or heating element; replace defective part (second echelon).

EQUIPMENT PERFORMANCE	12 Organizational equipment-----	Operate OPR POS circuit breaker to ON. Operate TH-5 NO. 1, through TH-5 NO. 3 switches to ON. Operate TA-182 NO. 1, through TA-182, NO. 6 switches to ON. Operate the equipments as described in the appropriate technical manuals (app. 1).	Neon lamp above OPR POS circuit breaker 2 lights. Neon lamps TH-5 NO. 1, TH-5 NO. 2, and TH-5 NO. 3 light. Neon lamps TA-182 NO. 1 through TA-182 NO. 6 light.	Replace faulty lamp. Replace faulty lamp. Replace faulty lamp.
STOPPING	13 Organizational equipment----- 14 Shelter -----	Perform the stopping procedures as described in the appropriate technical manuals (app. I). Operate TH-5 NO. 1 through TH-5 NO. 3 switches to OFF. Operate TA-182 NO. 1 through TA-182 NO. 6 switches to OFF. Operate OPR POS circuit breaker 2 to OFF. Perform the stopping procedures (par. 52).		

59. Replacement of Shelter Cables (Wiring Harness) (Fourth Echelon)

The signal wiring of the AN/MGC-17 consists of one 26-pair cable between the 26-pair receptacle in the SIGNAL & POWER ENTRANCE box and the binding posts in the SIGNAL BINDING POSTS box, one 14-pair cable between the SIGNAL BINDING POSTS box and the switchboard, and one 14-pair cable between the patching panel and the VF ringers numbered 1, 2, 3, and 4 (fig. 26). The two 14-pair cables are contained in the signal duct. Authorized replacement cables *ARE NOT* identical with those originally furnished in the shelter. Replacement procedures are covered in *a* below; color coding of the replacement cables is given in *b* below.

a. Replacement of Interior Cables. The interior cables should *not* be replaced when only one or two pairs have become defective. Use the spare pairs as replacement for the defective pairs.

(1) If the spare pairs have been used previously and the defect can be located, repair the defect by splicing. If an entire cable is accidentally cut or damaged beyond repair, or if a cable has been repaired previously and there is not enough slack to permit another repair, replace the cable.

(2) To install a replacement cable, first disconnect the defective cable and remove it from the ducts. Cut the new cable to the proper length (same as cable removed), secure it in the ducts. Connect the new cable; use the color coding given in *b* below.

b. Cable Color Coding. The chart in (1) below compares the color code of each pair of the original 14-pair cabling to the corresponding pairs in the authorized replacement cable; the chart in (2) below compares the color code for the original 26-pair cabling with the authorized replacement cable. Refer to figure 26 for the terminal points of the replacement cables.

(1) Color coding, 14-pair cabling.

Pair No.	Original cable color code		Replacement cable color code	
	Tip	Ring	Tip	Ring
1	White	Yellow	White	Blue
2	White	Orange	White	Orange
3	White	Black	White	Green
4	White	Pink	White	Brown
5	White	Light brown	White	Gray (slate)
6	White	Dark brown	Red	Blue
7	White	Silver	Red	Orange
8	White	Dark green	Red	Green
9	White	Light green	Red	Brown
10	White	Violet	Red	Gray (slate)
11	White	Gray (slate)	Black	Blue
12	White	Light blue	Black	Orange
13	White	Dark blue	Black	Green
14	Black	Pink	Black	Brown

(2) Color coding, 26-pair cabling.

Pair No.	Original cable color code		Replacement cable color code	
	Tip	Ring	Tip	Ring
1	White	Yellow	White	Blue
2	White	Orange	White	Orange
3	White	Black	White	Green
4	White	Pink	White	Brown
5	White	Light brown	White	Gray (slate)
6	White	Dark brown	Red	Blue
7	White	Silver	Red	Orange
8	White	Dark green	Red	Green
9	White	Light green	Red	Brown
10	White	Violet	Red	Gray (slate)
11	White	Gray (slate)	Black	Blue
12	White	Light blue	Black	Orange
13	White	Dark blue	Black	Green
14	Black	Silver	Black	Brown
15	Black	Gray (slate)	Black	Gray (slate)
16	Black	Light brown	Yellow	Blue
17	Black	Dark brown	Yellow	Orange
18	Black	Yellow	Yellow	Green
19	Black	Light blue	Yellow	Brown
20	Black	Dark blue	Yellow	Gray (slate)
21	Black	Light green	Violet	Blue
22	Black	Dark green	Violet	Orange
23	Black	Orange	Violet	Green
24	Black	Violet	Violet	Brown
25	Black	Pink	Violet	Gray (slate)
26	Dark blue	Pink	White	Red

CHAPTER 4

THEORY

60. General

Teletypewriter Central Office AN/MGC-17 contains facilities for 3 voice-frequency teletypewriter circuits which may be operated full-duplex or half-duplex. It also provides facilities for switching 12 lines of telegraph. Two of these lines are equipped with VF ringers. Four additional ringers are provided for use as required. All signal and power connections are made on the outside of the shelter. Cables from the switchboard and patching panel are connected to the binding posts, which are in parallel with the 26-pair connector. Wiring, for both signal and ac power, is contained in metal ducts. Ac power in the shelter is controlled at the POWER DISTRIBUTION PANEL. For the theory of operation on blowers, heater, and drop-line box, refer to TM 11-5805-204-15.

61. Modification of TT-76(*)/GGC Transmitter-distributor

(figs. 23 and 24)

The use of Communication Security Equipment in the AN/MGC-17 requires a modification to the transmitter-distributor of Teletypewriter Reperforator-Transmitter TT-76(*)/GGC (par. 26a). When this modification is accomplished (par. 26a), the energizing of the clutch magnet is under the direct control of the communication security equipment.

62. Signal Circuits

(figs. 25 and 26)

All incoming and outgoing signals are connected at either the SIGNAL & POWER ENTRANCE box or the SIGNAL BINDING POSTS box. From the SIGNAL & POWER ENTRANCE box, the incoming signals are applied through the SIGNAL BINDING POSTS box to the jack field sections of the switchboard and the patching panel.

a. Trunk and Local Circuits. The circuits of the AN/MGC-17 are made up of both trunk and local lines (par. 44). Trunk lines are usually provided from the patching panel in AN/MGC-17 to the SB-611/MRC. Local circuits are usually connected through the SIGNAL BINDING POSTS box to the switchboard.

b. Battery Supply. The NIGHT ALARM BATTERY box located below the switchboard supplies current for operating the night alarm buzzer and the switchboard panel lamps.

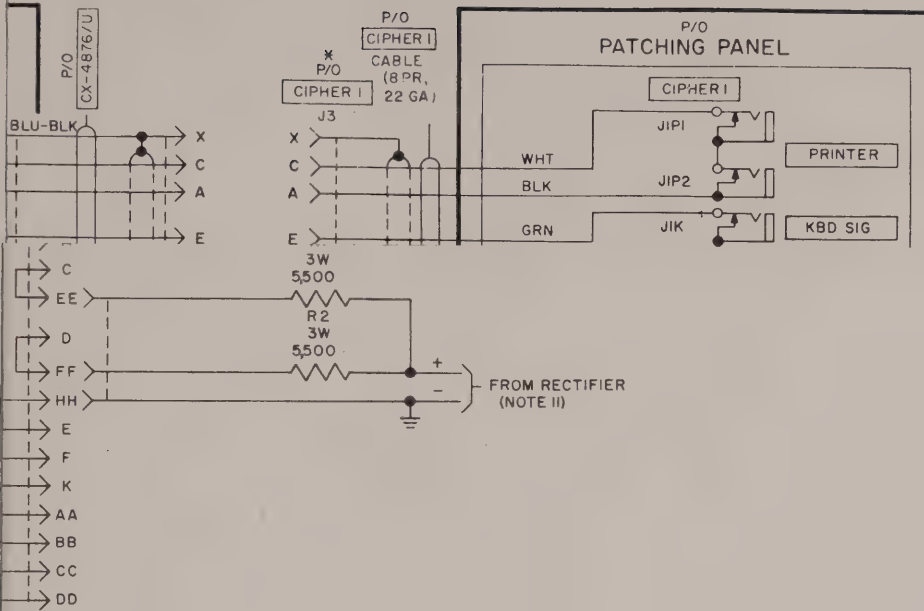
c. Cable and Connector Circuit Assignments. The 26-pair receptacle designated SIGNAL 1 is wired to binding posts 1 through 18 and 26, with pairs 19 through 25 left as spares. The 26-pair receptacle contacts are in two groups; male and female. Each group is divided into A sleeve and B tip section. The contacts on the 26-pair receptacle are interconnected so that 1A male connects to 1A female. All the contacts in section A male connect to the corresponding numbered contacts in A female. The same applies in the B section of the receptacle. One 14-pair cable connects the binding posts to the switchboard. The other 14-pair cable connects the patching panel to VF ringers 1 through 4.

d. Special Circuits. Telephone Set TA-312/PT can be connected through pair 26 of SIGNAL 1 receptacle or through LB PHONE binding posts in the SIGNAL BINDING POSTS box to provide intershelter communication. In the SIGNAL BINDING POSTS box, two additional pairs of binding posts provide entry of two local circuits into the shelter. These pairs of binding posts, designated A and B, together with the SIGNAL 1 pair 26 binding posts, are terminated in the JACK & BINDING POST panel.

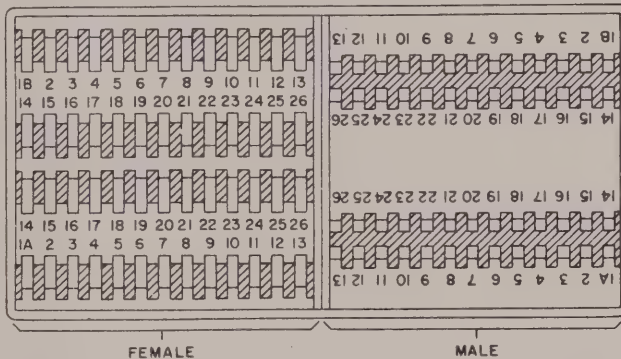
63. Ac Power

(fig. 27)

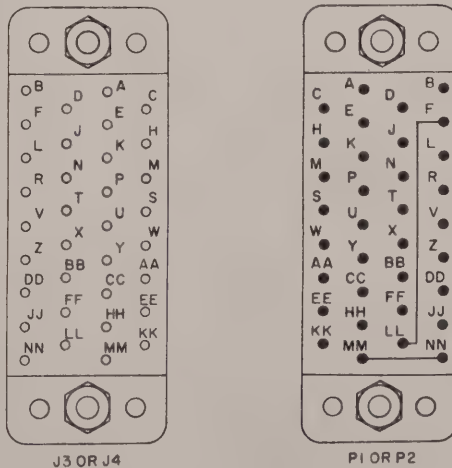
a. Power Supply. All electrical equipment in



16. 26-PAIR RECEPTACLE IS VIEWED FROM PIN AND SOCKET SIDE.



* RECEPTACLE AND PLUG ARE VIEWED FROM WIRING SIDE.



CHAPTER 4

THEORY

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b. Battery Supply. The NIGHT ALARM BATTERY box located below the switchboard supplies current for operating the night alarm buzzer and the switchboard panel lamps.

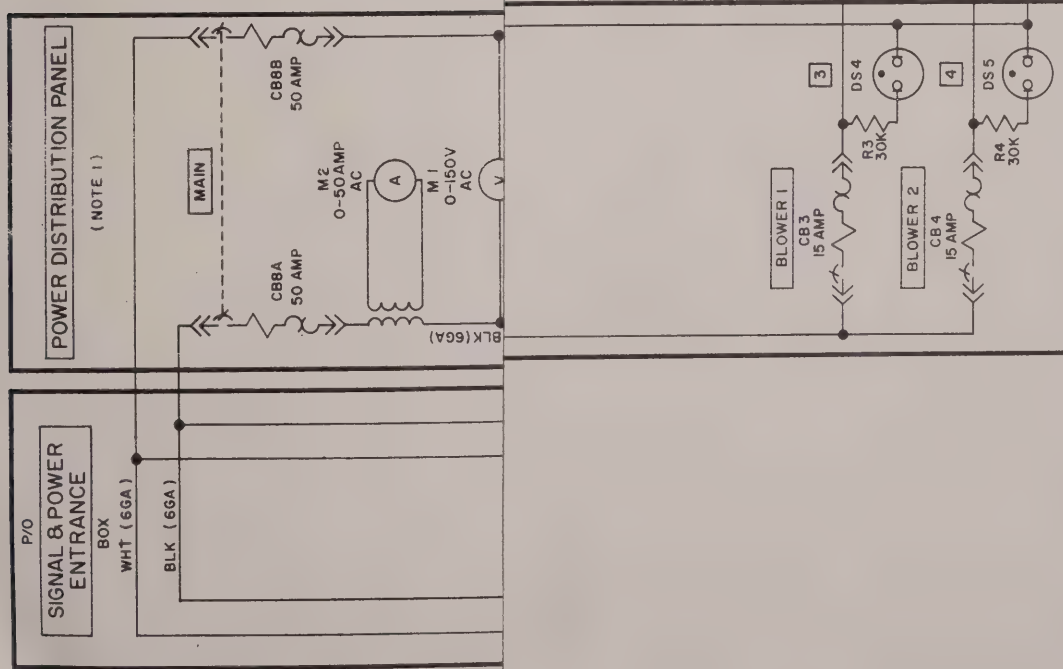
c. Cable and Connector Circuit Assignments. The 26-pair receptacle designated SIGNAL 1 is wired to binding posts 1 through 18 and 26, with pairs 19 through 25 left as spares. The 26-pair receptacle contacts are in two groups; male and female. Each group is divided into A sleeve and B tip section. The contacts on the 26-pair receptacle are interconnected so that 1A male connects to 1A female. All the contacts in section A male connect to the corresponding numbered contacts in A female. The same applies in the B section of the receptacle. One 14-pair cable connects the binding posts to the switchboard. The other 14-pair cable connects the patching panel to VF ringers 1 through 4.

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63. Ac Power

(fig. 27)

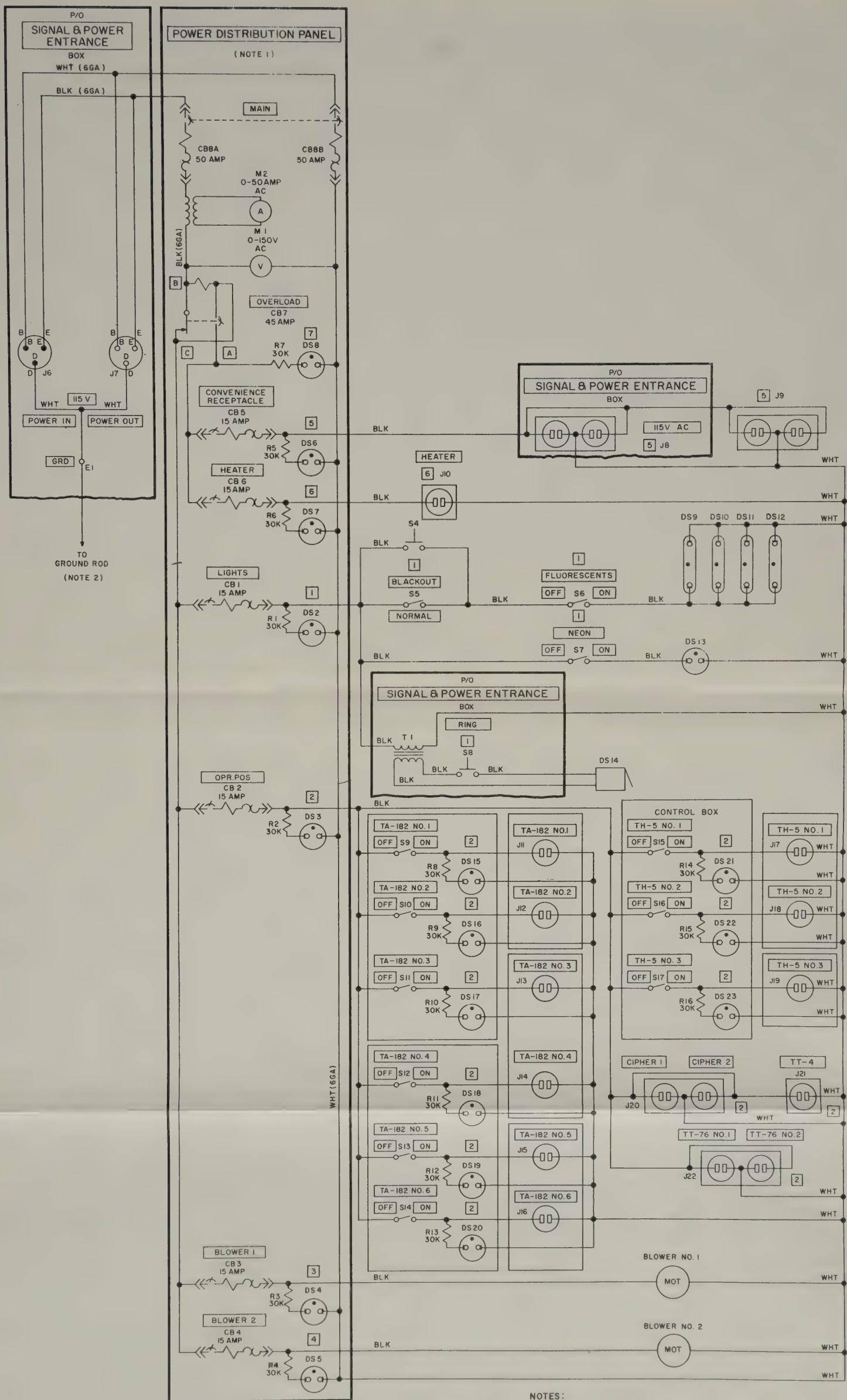
a. Power Supply. All electrical equipment in



NOTES:

1. WIRING OF POWER DISTRIBUTION PANEL IS 18 GAGE EXCEPT AS OTHERWISE INDICATED.
2. 1/4 IN. WIDE BRAID LEAD.
3. WIRING IS 14 GAGE UNLESS OTHERWISE INDICATED.
4. INDICATES EQUIPMENT MARKING.

Figure 27. Ac power schematic-wiring diagram.



NOTES:

1. WIRING OF POWER DISTRIBUTION PANEL IS 18 GAGE EXCEPT AS OTHERWISE INDICATED.
2. 1/4 IN. WIDE BRAID LEAD.
3. WIRING IS 14 GAGE UNLESS OTHERWISE INDICATED.
4. INDICATES EQUIPMENT MARKING.

Figure 27. Ac power schematic-wiring diagram.

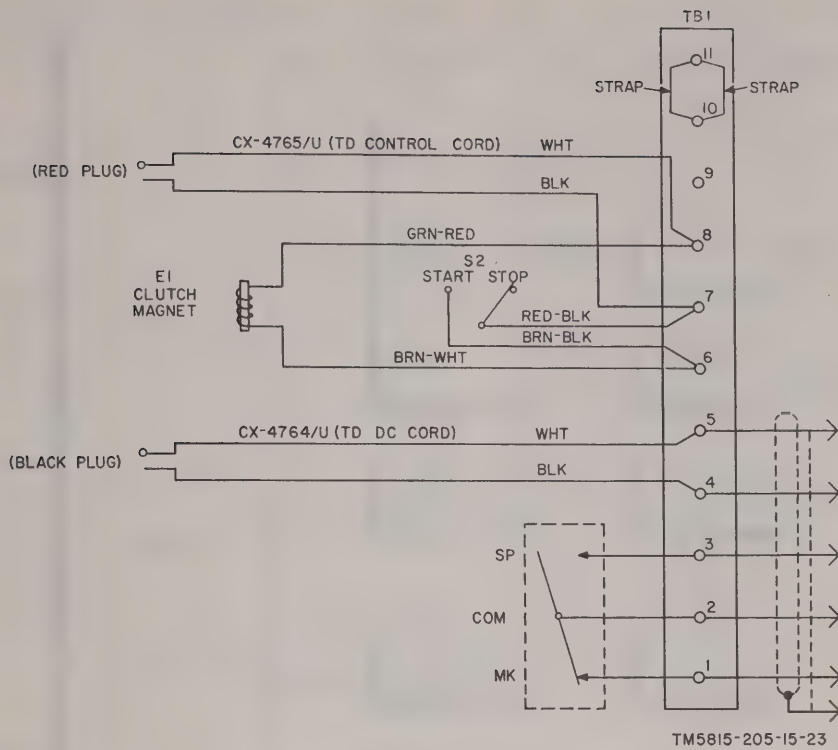


Figure 23. Teletypewriter Reperforator-Transmitter TT-76/GGC modification, schematic-wiring diagram.

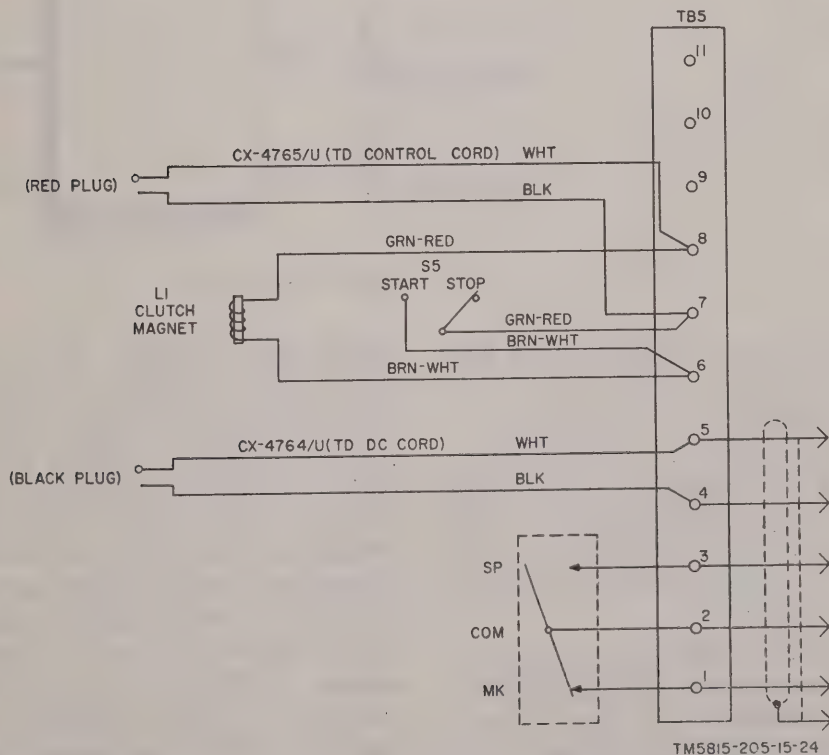


Figure 24. Teletypewriter Reperforator-Transmitter TT-76A/GGC modification, schematic-wiring diagram.

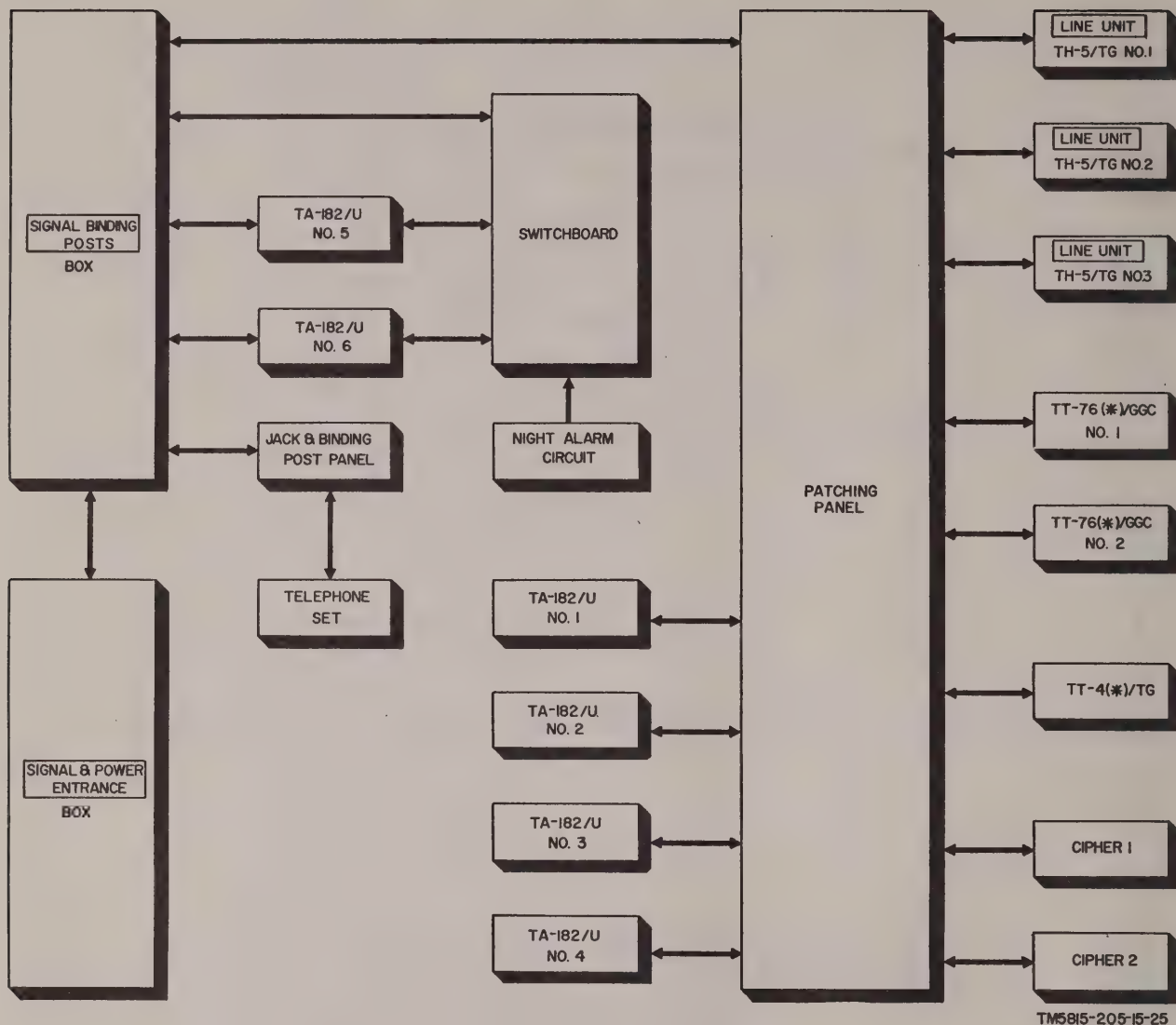


Figure 25. AN/MGC-17, signal block diagram.

the AN/MGC-17 is powered by either of two power units. Power from the generator set is connected into a switchbox. The switch box has switching facilities to select the output of either power unit. From the switchbox, power is connected to the SIGNAL & POWER ENTRANCE box. Power may also be obtained from a commercial source. For connection to a commercial source, refer to paragraph 42.

b. *Main Power Circuit.* POWER OUT receptacle J7 is wired in parallel with POWER IN receptacle J6 so another shelter may be connected to the same generator if the output (2,500 watts) of the generator is not exceeded. Power is applied through ducts to the POWER DIS-

TRIBUTION PANEL. In the POWER DISTRIBUTION PANEL, current flows through double-pole MAIN circuit breaker CB8 to ammeter M1 and to voltmeter M2. Power is distributed to the different circuits through circuit breakers. Each circuit has an indicating lamp connected in parallel with the circuit breaker. The power input to the shelter is not sufficient to enable all equipment to operate simultaneously. Therefore, to protect the power unit, 22-ampere OVERLOAD circuit breaker CB7 is provided on the POWER DISTRIBUTION PANEL. OVERLOAD circuit breaker CB7 cuts off power to the HEATER and CONVENIENCE RECEPTACLE if the circuits become over-

loaded, thus avoiding any interruption of power to the organizational equipment.

c. *Voltmeter and Ammeter.* Voltmeter M2, wired across the ac input circuit, indicates the ac voltage applied to the AN/MGC-17. It has a 0-150-volt full-scale deflection with a red line at 115 volts. Ammeter M1 indicates the total alternating current being used in the AN/MGC-17. It has a 0-50-ampere full-scale deflection scale. A current transformer with a ratio of 10 to 1 is used to couple the ammeter to the ac input. Its secondary is connected to the ammeter. Its primary, consisting of 3 turns of wire, is between MAIN circuit breaker CB8 and the individual circuit breakers. With 50 amperes flowing in the line, 5 amperes will flow in the secondary of the transformer and the meter will deflect to full scale.

d. *Tributary Power Circuits.* Individual circuit breakers CB3 and CB4, which are also used for ON-OFF switches, are provided for each

blower. Two duplex convenience receptacles connected in parallel, one in the SIGNAL & POWER ENTRANCE box and the other inside the shelter, are protected from overload by circuit breaker CB5. A separate circuit breaker, CB6, is provided for the heater because of the amount of current it draws. The heater is not required when the organizational equipment is operating.

e. *Lamp and Equipment Circuits.* NORMAL-BLACKOUT switch S5, wired in parallel with door microswitch S4, controls the flow of current to the light and fluorescent lamps. NEON lamp DS13 has its own ON-OFF switch, S7. With the NORMAL-BLACKOUT switch at BLACKOUT, current flows through switch S4. When the door is opened, switch S4 opens and current cannot flow to the lamps. When the NORMAL-BLACKOUT switch is at NORMAL, current flows through this switch and bypasses switch, S4.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE, TRANSPORTATION, AND DEMOLITION

Section I. SHIPMENT AND LIMITED STORAGE, TRANSPORTATION

64. Disassembly of Equipment

When Teletypewriter Central Office AN/MGC-17 is to be moved to a different location, perform the following operations:

a. Turn off all ac power switches and circuit breakers except the FLUORESCENTS switch, the LIGHTS circuit breaker, and the MAIN circuit breakers.

b. Remove the KWK-9/TSEC, KWA-7/TSEC, and applicable keying materials and store them in the TSEC/KW-9 accessory case. Turn them over to the accountable officer for secure transit to next location. The KWB-9/TSEC may be left in the shelter during transit.

c. Fasten the telephone set in its mounting (fig. 7).

d. Fasten the wastepaper basket in its holder (fig. 8).

e. Secure the heater in its mounting (fig. 10).

f. Collect the miscellaneous components and place them in the ACCESSORIES & SPARES cabinet in the shelter.

g. Secure the chairs (fig. 6).

h. Check to see that everything is fastened in position.

i. Disconnect the 26-pair cable in the SIGNAL & POWER ENTRANCE box, and replace the covers on the receptacles and connectors (par. 45).

j. Wind the 26-pair cables on the cable reel.

k. Install the cable reel in the shelter (fig. 10), leaving space for the power cable reel at the rear:

- (1) Position the cable reel in the shelter with the center of the hub directly over the mounting plate on the floor.
- (2) Remove the cable reel holder from its mounting, engage the stud with the

reel hub and mounting plate, and tighten the holder.

l. Operate the FLUORESCENTS switch, the LIGHTS circuit breaker, and the MAIN circuit breaker to OFF.

m. If the power was obtained from the generator set, proceed as follows:

- (1) Stop the generator set (TM 11-900A).
- (2) Disconnect the power cable, power stub, and ground lead from the switch box, and replace the covers on the receptacles and connectors.
- (3) Secure the switchbox in its mounting (fig. 10) in the shelter.

n. If the power was obtained from a commercial source, proceed as follows:

- (1) Remove the power from the source terminals.
- (2) Disconnect the power stub from the commercial source.
- (3) Disconnect the junction box from the power cable and power stub, and replace the cover on the junction box and both cables.
- (4) Mount the junction box in its bracket (fig. 9).

o. Disconnect the power cable from the POWER IN receptacle in the SIGNAL & POWER ENTRANCE box, and replace the covers on the connector and receptacle.

p. Disconnect the ground leads from the GND lug on the switchbox and the GRD lug in the SIGNAL & POWER ENTRANCE box.

q. Close and secure the covers of the SIGNAL & POWER ENTRANCE and SIGNAL BINDING POSTS boxes with the wing fasteners.

r. Disconnect the ground leads from the shelter and generator set ground rods and store

one lead in the ACCESSORIES box of the trailer and the other in the ACCESSORIES & SPARES cabinet in the shelter (fig. 6).

s. Remove the ground rods from the ground and install them in their mountings in the shelter (fig. 7) and trailer (TM 11-5805-204-15).

t. Wind the power stubs first and then the power cable on a cable reel.

u. Install the power cable reel next to the 26-pair cable reel (*k* above) in the shelter.

v. Place the ladder on top of the cable reels and secure it to the reels with the web straps.

w. Inspect the area around the shelter and trailer for loose items. Be sure that all items are properly stored.

x. Close and secure the blower vents, air filter cover, and message box cover.

y. Close the door and lock it.

65. Transportation

The shelter can be transported to another site either by truck or by helicopter. To load the shelter onto a truck or lift it by helicopter, refer to paragraph 39.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

66. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 67 will be used to prevent further use of the equipment. Demolition instructions for the Communication Security Equipment are included in their appropriate publications (app. I).

67. Methods of Destruction

Use any or all of the following methods to destroy the equipment.

a. *Smash*. Smash the controls, tubes, coils, relays, switches, capacitors, transformers, and

meters; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. *Cut*. Cut all cables and cords and slash the wiring on the components; use axes, handaxes, or machetes.

c. *Burn*. Burn cords and technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

d. *Bend*. Bend panels and cabinets.

e. *Explode*. If explosive are necessary, use firearms, grenades, or TNT.

f. *Dispose*. Bury or scatter the destroyed parts in slit trenches or foxholes, or throw them into streams.

APPENDIX I

REFERENCES

The following applicable references are available for the operator and installer of Teletypewriter Central Office AN/MGC-17.

TM 11-2225	Teletypewriter Sets AN/GGC-3 and AN/GGC-3A and Teletypewriter Rep perforator-Transmitters TT-76/GGC, TT-76A/GGC, and TT-76B/GGC.
TM 11-2202	Manual Telephone Switchboard SB-22/PT.
TM 11-5815-206-12	Operation and Organizational Maintenance Teletypewriter Set AN/PGC-1 and Teletypewriters TT-4A/TG, and TT-4B/TG.
TM 11-2137	Telegraph-Telephone Signal Converter TA-182/U.
TM 11-2239	Telegraph-Telephone Terminal AN/TCC-14.
TM 11-900A	Power Unit PE-75-AF.
TM 11-2155	Telephone Set TA-312/PT.
TM 11-5805-204-15	Operator's, Organizational, Field, and Depot Maintenance Manual Communication Patching Panel SB-611/MRC.
KAM-10/TSEC	Repair and Maintenance Instructions for TSEC/KW-9.
KAO-33/TSEC	Operation of TSEC/KW-9.
KAO-8/TSEC	Pythom Operation.
TB SIG 340	Communication Security Equipment TSEC/KW-9 (U).

APPENDIX II

MAINTENANCE ALLOCATION CHART

1. General

a. The maintenance allocation chart assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are defined as follows:

- (1) *Part or component.* Only the nomenclature or standard item name is given in this column. Additional descriptive information is included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.
- (2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operation. These are defined as follows:
 - (a) *Service.* To clean, to preserve, and to replenish fuel and lubricants.
 - (b) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.
 - (c) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.
 - (d) *Replace.* To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.
 - (e) *Repair.* To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grind-

ing, riveting, straightening, adjusting, etc.

- (f) *Rebuild.* To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.
 - (3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.
 - (4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.
 - (5) *Remarks.* Entries in this column are used to clarify data in the other columns.
- c. Columns in the allocation of tools for maintenance function chart are defined as follows:
- (1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.
 - (2) *1st, 2d, 3d, 4th, 5th echelon.* A dagger (†) symbol indicates the echelons allocated the facility.
 - (3) *Tool code.* This column lists the tool code assigned.

- (4) *Remarks.* Entries in this column are used to clarify data in the other columns.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of this maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

4. References

Additional instructions concerning maintenance of this equipment are contained in:

TM 11-3895-202-12P, Operators and Organizational Maintenance Repair Parts and Spe-

cial Tools List and Maintenance Allocation Chart for Reel Unit RL-31-B-C-D and E.

TM 11-5805-247-12P, Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Converter, Telegraph-Telephone Signal TA-182/U.

TM 11-5805-246-12P, Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Terminal, Telegraph TH-5/TG.

TM 11-5805-262-20P, Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Switchboard, Telephone, Manual SB-22/PT.

TM 11-5815-206-12P, Operator's and Organizational Maintenance Repair Parts and Special Tools List for Teletypewriter Set AN/PGC-1.

TM 11-5815-238-12P, Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Teletypewriter Set AN/GGC-3 and AN/GGC-3A.

Maintenance Allocation Chart.

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TELETYPEWRITER CENTRAL OFFICE AN/MGC-17	service	X						Interior
	inspect		X					Exterior
	test		X				2, 3	Interior and exterior
	repair		X				1	Continuity
BATTERY BOXES	rebuild		X				2, 3	
	replace				X			Fabricate
	repair		X					
	replace		X					
CAPS, ELECTRICAL	replace							
POSTS, BINDING	replace							
RECEPTACLE, TURNLOCK, FASTENER	replace		X					
SPACERS, SLEEVE	replace		X					
BOX, MESSAGE, ASSEMBLY	replace				X			Fabricate
RECEPTACLES, TURNLOCK FASTENER	replace		X					
BRACKETS, and HOLDERS	replace				X			Fabricate
BULLETIN BOARD	repair				X			Fabricate
BUZZERS	replace		X					Fabricate
CABINETS, STORAGE	replace				X			
CABLE ASSEMBLIES	repair		X					
BAND, MARKER, CABLE	replace			X				Fabricate
CABLE	replace		X					
CONNECTORS	replace		X					Separate MAC for 26 pair connectors
TERMINAL LUGS (for Power Cable)	repair							
CLOCK, WALL	replace		X					
CONDUIT ASSEMBLIES	replace		X					
BALLASTS, LAMP	repair		X					
BUSHINGS, ELECTRICAL CONDUCTOR	replace		X					
CAPACITORS	replace		X					
CLIPS, SPRING TENSION	replace		X					
CONNECTORS, RECEPTACLE, ELECTRICAL	replace		X					
GLOBES, ELECTRIC LIGHT	replace		X					
HOLDERS, LAMPHOLDER	replace				X			Fabricate
INSULATORS, BUSHING	replace		X					

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
AN/MGC-17 (continued)								
JACKS, TELEPHONE	replace		X					
LAMP HOLDERS	replace		X					
LAMPS	replace	X						
POSTS, BINDING	replace		X					
STARTERS, LAMP, FLOURESCENT	replace	X						
SWITCHES	replace		X					
CORD ASSEMBLIES	repair		X					
BAND, MARKER CABLE	replace		X	X				Fabricate
CABLE	replace		X					
PLUGS, TELEPHONE	replace		X					
COVERS, AIR FILTER	repair			X				
DOOR ASSEMBLIES	replace			X				
GASKETS	replace			X				
RECEPTACLES, TURNLOCK, FASTENER	replace		X		X			Fabricate
SCREENS, FILTER	replace			X				
COVERS, VENTILATORY	replace			X				
DOOR ASSEMBLIES	replace			X				
GASKETS	replace			X				
RECEPTACLES, TURNLOCK FASTENER	replace		X					
CURTAIN INSTALLATION	repair		X					
CURTAIN	replace		X					
STUDS, SNAP FASTENER	replace		X					
DISTRIBUTION BOX	repair		X					
CHAIN BEAD	replace		X					
CONNECTORS	replace		X					Separate MAC for 26 pair connectors
COVERS, ELECTRICAL CONNECTOR	repair		X					
DOOR ASSEMBLY	replace		X	X				
GASKETS	replace			X				
RECEPTACLES, TURNLOCK FASTENER	replace		X					
TERMINAL STUD	replace		X					
DISTRIBUTION BOX, (DROP LINE BOX)	repair		X					
CAPS, ELECTRICAL	replace		X					
CONNECTORS, RECEPTACLE, ELECTRICAL	repair							Separate MAC
COVERS	replace				X			Fabricate

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
AN/MGC-17 (continued)								
GASKETS	replace		X					
POSTS, BINDING	replace		X					
STRIP, DESIGNATION	replace			X				
DUCT ASSEMBLY, FAN, CENTRIFUGAL	repair		X					
MOTOR, ALTERNATING CURRENT	replace		X					
FILTER, AIR CONDITIONING	replace		X					
FLASHLIGHT	repair	X						
BATTERIES, BA-30	replace	X						
LAMP, INCANDESCENT	replace	X						
GENERATOR, GASOLINE ENGINE, TRAILER MOUNTED	repair							Separate MAC
PU-322/G								
HEATER, SPACE, ELECTRIC	repair		X					
BUSHING, ELECTRICAL CONDUCTOR	replace		X					
CABLE, POWER, ELECTRICAL	replace		X					
CONNECTORS	replace		X					
HEATING, ELEMENT, ELECTRICAL	replace		X					
IMPELLER, FAN, AXIAL	replace		X					
MOTOR, ALTERNATING CURRENT	replace		X					
SWITCHES	replace		X					
HOLDERS, CABLE, REEL	repair		X					
CHAIN, BEAD	replace		X					
JACK, ASSEMBLY, TELEPHONE	repair		X					
DESIGNATION STRIP	replace		X					
FRAME ASSEMBLY	replace				X			Fabricate
HOLDER, DESIGNATION STRIP	replace				X			Fabricate
JACK MOUNTING	replace				X			Fabricate
JACK, TELEPHONE	replace		X					
WINDOW	replace			X				Fabricate
LIGHT, EXTENSION	replace	X						
LAMP, INCANDESCENT	replace	X						
PANEL, POWER DISTRIBUTION	repair		X			X		
	rebuild							
CIRCUIT BREAKERS	replace		X					
LAMPS, GLOW	replace	X						
LAMP HOLDERS	replace		X					

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	MAINTENANCE FUNCTION	1ST ECH	2ND ECH	3RD ECH	4TH ECH	5TH ECH	TOOLS REQUIRED	REMARKS
V/MC-17 (continued)								
METERS	replace		X					
RESISTORS	replace		X					
TRANSFORMERS	replace		X					
REEL UNIT RL-31	repair							
SHIELTER, ELECTRICAL EQUIPMENT	repair							Separate MAC
SWITCH BOX, SA-331 G	repair							Separate MAC
TELEGRAPH-TELEPHONE SIGNAL CONVERTER TA-182/U	repair							Separate MAC
TELEGRAPH TERMINAL TH-5/TG	repair							Separate MAC
TELEPHONE SET TA-312/PT	repair							Separate MAC
TELEPHONE SWITCHBOARD SB-22/PT	repair							Separate MAC
TELETYPEWRITER SET TT-4A/TG	repair							Separate MAC
TELETYPEWRITER SET TT-76/GC	repair							Separate MAC
TERMINAL BOX	repair		X					
	rebuild					X		
CAPS, ELECTRICAL	replace		X					
DOORS, ASSEMBLY	replace			X				
GASKETS	replace		X					
POSTS, BINDING	replace		X					
RECEPTACLES, TURNLOCK FASTENER	replace		X					
TERMINAL BOARD	replace				X			Fabricate
WIRING, HARNESS	replace				X			Fabricate
CABLE	repair		X					
CONNECTORS	replace		X		X			Separate MAC for 26 pair Connectors

Allocation of Tools for Maintenance Functions

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
AV/MGC-17 (continued)							
MULTIMETER AV/URN-105		+	+	+	+	1	If not available, use TS-297/U or TS-352/U
TOOL KIT, GENERATOR MECHANIC		+	+	+	+	2	
SOLDERING IRON TL-117		+	+	+	+	3	

INDEX

	Paragraph	Page		Paragraph	Page
Authority for demolition-----	66	61	Control box, description-----	18	18
Cable connections, 26-pair-----	45	40	Control or instrument:		
Characteristics, technical-----	4	4	Electrical Space Heater HD-375/ U.	40c	38
Checking:			Miscellaneous switches-----	40b	37
Contents-----	23b	22	POWER DISTRIBUTION PANEL	40a	37
Organizational equipment-----	23c	22	Switchbox SA-331/U-----	40d	38
Checklist, equipment performance-----	58	50			
Circuit planning-----	44	40	Daily preventive maintenance-----	55	49
Circuits:			Demolition, authority-----	66	61
Lamp and equipment-----	63e	59	Description:		
Local on field wire-----	44a	40	Communication Security Equip- ment:		
Local or trunk on cable-----	44b	40	SSM-33 and TT-21/FG-----	21h	21
Main power-----	63c	59	TSEC/KW-9-----	21f	21
Special-----	44c, 62d	40, 56	Control box-----	18	18
Trunks and local-----	62a	56	Distribution Box J-1077/U-----	12	16
Climates:			Electrical Space Heater HD-375/U	16	17
Cold-----	53a	48	JACK AND BINDING POST	17	18
Hot-----	53b	48	PANEL.		
Warm damp-----	53c	48	Manual Telephone Switchboard	21a	21
Color coding, cable-----	59b	54	SB-22/PT.		
Comments on manual-----	2d	3	Modified Electrical Equipment	8	9
Common names-----	6	8	Shelter S-144/G.		
Components:			Patching and installation, cords and cables.	20	19
Less organizational equipment-----	5a	4	Patching panel-----	15	17
Organizational equipment-----	5b	6	POWER DISTRIBUTION PANEL	13	16
Patching and installation, cords and cables.	5a	4	Range Adapter Test Set TSEC/ ST-3.	21g	21
Running spares-----	5d	6	Safe-----	19	19
Stored in ACCESSORIES & SPARES cabinet.	5c	6	SIGNAL & POWER ENTRANCE	11	16
Communication Security Equip- ment:			box.		
SSM-33 and TT-21/FG-----	33	30	SIGNAL BINDING POSTS box-----	10	16
TSEC/KW-9-----	28	28	Telegraph Line Control C-2894/TG.	14	17
Connection:			Telegraph-Telephone Signal Con- verter TA-182/U.	21e	21
Manual Telephone Switchboard	24a	22	Telegraph Terminal TH-5/TG-----	21d	21
SB-82/PT.			Telephone Set TA-312/PT-----	21i	21
Telegraph-Telephone Signal Con- verter TA-182/U.	29b	29	Teletypewriter Central Office AN/ MGC-17.	7	9
Telegraph Terminal TH-5/TG-----	25b, 34a	24, 31	Teletypewriter Reperforator-Trans- mitter TT-76(*)/GGC.	21b	21
Telephone Set TA-312/PT-----	30	30	Teletypewriter TT-4(*)/TG-----	21c	21
Teletypewriter Reperforator- Transmitter TT-76(*)/GGC.	34b	31	Tool Equipment TE-49 and TE-33--	21j	21
Teletypewriter TT-4(*)/TG-----	34c, 27a	31, 27	Trailer Mounted Gasoline Engine	9	10
Connections:			Generator Set PU-322/G.		
Cable, 26-pair-----	45	40	Destruction methods-----	67	61
Field wire-----	46	41	Disassembly of equipment-----	64	60
Organizational equipment to patch- ing panel.	34	30	Distribution Box J-1077/U, descrip- tion.	12	16
Power-----	42	38	Dropline box, field wire connections-----	46b	41
Contents:					
Checking-----	23b	22			
Removing-----	23a	22			

	Paragraph	Page
Electrical Space Heater HD-375/U:		
Control	40c	38
Description	16	17
Energizing ac circuits	43	39
Equipment:		
Disassembly	64	60
Less organizational	5a	4
Organizational	1d, 5b,	3, 6,
	21	21
Performance checklist	58	50
Field wire:		
Connections	46	41
Dropline box	46b	41
SIGNAL BINDING POSTS box	46a	41
Floor plan	8e	10
Forms and records	2	3
Front wall	8c	9
General:		
Procedures	22	22
Theory	60	56
Grounding:		
Generator set	41b	38
Shelter	41a	38
Hot climates	53b	48
Installation:		
Communication Security Equip-		
ment:		
SSM-33 and TT-21/FG	33	30
TSEC/KW-9	28	28
Cords and cables	20	19
Manual Telephone Switchboard	24a	22
SB-22/PT.		
Procedures	22	22
Range Adapter Test Set TSEC/	32	30
ST-3.		
Shelter	39	34
Telegraph Line Control C-2894/TG.	25	23
Telegraph-Telephone Signal Con-	29	28
verter TA-182/U.		
Telegraph Terminal TH-5/TG	25	23
Telephone Set TA-312/PT	30	30
Teletypewriter Reperforator-		
Transmitter TT-76(*)/GGC.	26	24
Teletypewriter TT-4(*)/TG	27	27
Tool Equipment TE-49 and TE-33.	31	30
JACK AND BINDING POST PANEL,	17	18
description.		
Lamp and equipment circuits	63e	59
Left wall	8a	9
Lighting	8f	10
Loading	39a	34
Local circuits on field wire	44a	40
Local or trunk circuits on cable	44b	40
Main power circuits	63c	59
Maintenance:		
Daily preventive	55	49

	Paragraph	Page
Maintenance—Continued		
Monthly cleaning and lubrication	57	49
Scope	54	49
Weekly preventive	56	49
Manual Telephone Switchboard SB-22/		
PT:		
Connection	24a	22
Description	21a	21
Installation	24b	23
Methods of destruction	67	61
Miscellaneous switches	40b	37
Modifications of Teletypewriter Reper-	26a, 61	24, 56
forator-Transmitter TT-76(*)/GGC.		
Modified Electrical Equipment Shelter	8	9
S-144/G, description.		
Monthly operation cleaning and	57	49
lubrication.		
Names, common	6	8
Nonsecure teletypewriter operation,	49	42
patching.		
Operating:		
Ac circuits	43	39
Procedures	48	41
Operation:		
Types	47	41
Under unusual conditions	53	48
Organizational equipment	1d, 5b,	3, 6,
	21	21
Patching cords	5a, 20	4, 19
Patching for nonsecure teletypewriter	49	42
operation.		
Patching for secure teletypewriter	50	45
operation.		
Patching panel	15	17
Planning circuits	44	40
Power:		
Connections	42	38
Organizational equipment instal-	35	31
lation test.		
Power and wiring	8g	10
Requirements	4	4
Supply	63a	56
Transfer	51	48
POWER DISTRIBUTION PANEL:		
Control or instrument	40	37
Description	13	16
Procedures:		
Installation	22	22
Operating	48	41
Organizational equipment instal-	35	31
lation test.		
Stopping	52	48
Testing (secure and nonsecure	36, 37	32, 33
teletypewriters).		
Purpose and use	3	4
Range Adapter Test Set TSEC/ST-3:		
Description	21g	21
Installation	32	30

	Paragraph	Page		Paragraph	Page
Rear wall	8d	9	Telephone Set TA-312/PT:		
Records, forms	2	3	Description	21i	21
Removing contents	23a	22	Installation and connection	30	30
Replacement of shelter cables	59	54	Teletypewriter Central Office AN/ MGC-17, description.	7	9
Right wall	8b	9	Teletypewriter Reperforator-Trans- mitter TT-76(*)/GGC:		
Running spares	5d	6	Connection	34b	31
Safe, description	19	19	Description	21b	21
Scope	1	3	Installation	26	24
Scope of maintenance	54	49	Modification	26a, 61	24, 56
Secure teletypewriter operation, patching.	50	45	Teletypewriter TT-4(*)/TG:		
Shelter:			Connection	34c, 31a	31, 30
Grounding	41a	38	Description	21c	21
Installation	39	34	Installation	27	27
Loading	39a	34	Testing procedures (secure and non- secure teletypewriters).	36, 37	32, 33
Siting	38	34	Theory, general	60	56
Unloading	39c	37	Tool Equipment TE-49 and TE-33:		
SIGNAL & POWER ENTRANCE box, description.	11	16	Description	21j	21
SIGNAL BINDING POSTS box:			Installation	31	30
Description	10	16	Trailer Mounted Gasoline Engine Generator Set PU-322/G, description.	9	10
Field wire connections	46a	41	Transfer, power	51	48
Signal circuits analysis, block diagram ..	62	56	Transportation	65	61
Siting	38	34	Trunk and local circuits	62a	56
Spares, running	5d	6	Types of operation	47	41
Special circuits	44c, 62d	40, 56	Unloading	39c	37
Stopping procedures	52	48	Unpacking and checking	23	22
Switches, miscellaneous	40b	37	Unpacking organizational equipment ..	23c	22
Switch Box SA-331/U, control	40d	38	Unusual conditions, operation	53	48
Technical characteristics	4	4	Use, purpose	3	4
Telegraph Line Control C-2894/TG, description.	14	17	Voltmeter and ammeter	63d	59
Telegraph-Telephone Signal Converter TA-182/U:			Wall:		
Connection	29b	29	Front	8c	9
Description	21e	21	Left	8a	9
Installation	29a	28	Rear	8d	9
Telegraph Terminal TH-5/TG:			Right	8b	9
Connection	25b, 34a	24, 31	Warm, damp climates	53c	48
Description	21d	21	Weekly preventive maintenance	56	49
Installation	25a	23	Weights	4	4
			Wiring and power	8g	10

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

Def Atomic Spt Agcy (5)
USASA (2)
CNGB (1)
Tech Stf, DA (1) except
CSigO (18)
Tech Stf Bd (1)
US Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA AD Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA ATB (1)
USCONARC (5)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5) except
First USA (7)
Corps (2)
Div (2)
USATC (2)
Svc Colleges (5)
Br Svc Sch (5) except
USASCS (49)
GENDEP (2) except
Atlanta GENDEP (none)
Sig Sec, GENDEP (10)
Sig Dep (17)
Army Pictorial Cen (2)
Engr Maint Cen (1)
USA Ord Msl Comd (3)
USASSA (15)
USASSAMRO (1)
USA Sig Pub Agcy (8)

USA Sig Engr Agcy (1)
USA Comm Agcy (2)
USA Sig Eqp Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
WRAMC (1)
AFIP (1)
AMS (1)
Ports of Emb (OS) (2)
Trans Terminal Comd (1)
Army Terminal (1)
OS Sup Agcy (1)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Lab (5)
Sig Fld Maint Shops (3)
USA Corps (Res) (1)
JBUSMC (2)

Units org under fol TOE:

11-5 (2)
11-7 (2)
11-8 (2)
11-15 (2)
11-16 (2)
11-17 (2)
11-18 (2)
11-55 (2)
11-57 (2)
11-85 (2)
11-86 (2)
11-97 (2)
11-117 (2)
11-155 (2)
11-500 (AA-AE) (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

TM 11-5815-205-15 TELETYPEWRITER CENTRAL OFFICE AN/MGC-17-1959